Call for Editorial Board Members

As you are well aware that we are a medical and health sciences publishers; publishing peer-reviewed journals and books since 2004.

We are always looking for dedicated editorial board members for our journals. If you completed your master's degree and must have at least five years experience in teaching and having good publication records in journals and books.

If you are interested to be an editorial board member of the journal; please provide your complete resume and affiliation through e-mail (i.e. info@ rfppl.co.in) or visit our website (i.e. www.rfppl.co.in) to register yourself online.

Call for Publication of Conference Papers/Abstracts

We publish pre-conference or post-conference papers and abstracts in our journals, and deliver hard copy and giving online access in a timely fashion to the authors.

For more information, please contact:

For more information, please contact:
A Lal
Publication-in-charge
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi – 110 091 (India)
Phone: 91-11-22754205, 45796900
E-mail: info@rfppl.co.in

Free Announcements of your Conferences/Workshops/CMEs

This privilege to all Indian and other countries conferences organizing committee members to publish free announcements of your conferences/ workshops. If you are interested, please send your matter in word formats and images or pictures in JPG/JPEG/Tiff formats through e-mail attachments to sales@rfppl.co.in.

Terms & Conditions to publish free announcements:

1. Only conference organizers are eligible up to one full black and white page, but not applicable for the front, inside front, inside back and back cover, however, these pages are paid.
2. Only five pages in every issue are available for free announcements for different conferences.
3. This announcement will come in the next coming issue and no priority will be given.
4. All legal disputes subject to Delhi jurisdiction only.
5. The executive committee of the Red Flower Publication reserve the right to cancel, revise or modify terms and conditions any time without prior notice.

For more information, please contact:
A Lal
Publication-in-charge
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi – 110 091 (India)
Phone: 91-11-22754205, 45796900
E-mail: info@rfppl.co.in

Win Free Institutional Subscription!

Simply fill out this form and return scanned copy through e-mail or by post to us.

Name of the Institution____
Name of the Principal/Chairman____
Management (Trust/Society/Govt./Company)_____________________________
Address 1________________________
Address 2________________________
Address 3________________________
City__________________
Country______________
PIN Code_____________
Mobile_______________
Email________________

We are regular subscriber of Red Flower Publication journals.

Year of first subscription_______________

List of ordered journals (if you subscriberd more then 5 titles, please attach separate sheet)

Ordered through

Name of the Vendor	Subscription Year	Direct/subs Yr

Name of the journal for which you wish to be free winner

Terms & Conditions to win free institutional subscription

1. Only institutions can participate in this scheme
2. In group institutions only one institution would be winner
3. Only five institutions will be winner for each journal
4. An institution will be winner only for one journal
5. The free subscription will be valid for one year only (i.e. 1 Jan – 31 Dec)
6. This free subscription is not renewable, however, can be renewed with payment
7. Any institution can again participate after five years
8. All legal disputes subject to Delhi jurisdiction only
9. This scheme will be available to participate throughout year, but draw will be held in last week of August every year
10. The executive committee of the Red Flower Publication reserve the right to cancel, revise or modify terms and conditions any time without prior notice.

I confirm and certify that the above information is true and correct to the best of my knowledge and belief.

Place: Signature with Seal
Date:

Revised Rates for 2020 (Institutional) Title of the Journal	Frequency	India(INR) Print Only	India(INR) Online Only	Outside India(USD) Print Only	Outside India(USD) Online Only
Community and Public Health Nursing	3	6000	5500	469	430
Indian Journal of Agriculture Business	2	6000	5500	469	430
Indian Journal of Anatomy	4	9000	8500	703	664
Indian Journal of Ancient Medicine and Yoga	4	8500	8000	664	625
Indian Journal of Anesthesia and Analgesia	6	8000	7500	625	586
Indian Journal of Biology	2	6000	5500	469	430
Indian Journal of Cancer Education and Research	2	9500	9000	742	703
Indian Journal of Communicable Diseases	2	9000	8500	703	664
Indian Journal of Dental Education	4	6000	5500	469	430
Indian Journal of Diabetes and Endocrinology	2	8500	8000	664	625
Indian Journal of Emergency Medicine	4	13000	12500	1016	977
Indian Journal of Forensic Medicine and Pathology	4	16500	16000	1289	1250
Indian Journal of Forensic Odontology	2	6000	5500	469	430
Indian Journal of Genetics and Molecular Research	2	7500	7000	586	547
Indian Journal of Law and Human Behavior	3	6500	6000	508	469
Indian Journal of Legal Medicine	2	9000	8500	703	664
Indian Journal of Library and Information Science	3	10000	9500	781	742
Indian Journal of Maternal-Fetal & Neonatal Medicine	2	10000	9500	781	742
Indian Journal of Medical and Health Sciences	2	7500	7000	586	547
Indian Journal of Obstetrics and Gynecology	4	10000	9500	781	742
Indian Journal of Pathology: Research and Practice	6	12500	12000	977	938
Indian Journal of Plant and Soil	2	7000	6500	547	508
Indian Journal of Preventive Medicine	2	7500	7000	586	547
Indian Journal of Research in Anthropology	2	13000	12500	1016	977
Indian Journal of Surgical Nursing	3	6000	5500	469	430
Indian Journal of Trauma and Emergency Pediatrics	4	10000	9500	781	742
Indian Journal of Waste Management	2	10000	9500	781	742
International Journal of Food, Nutrition & Dietetics	3	6000	5500	469	430
International Journal of Forensic Science	2	10500	10000	820	781
International Journal of Neurology and Neurosurgery	4	11000	10500	859	820
International Journal of Pediatric Nursing	3	6000	5500	469	430
International Journal of Political Science	2	6500	6000	508	469
International Journal of Practical Nursing	3	6000	5500	469	430
International Physiology	3	8000	7500	625	586
Journal of Animal Feed Science and Technology	2	8300	7800	648	609
Journal of Cardiovascular Medicine and Surgery	4	10500	10000	820	781
Journal of Emergency and Trauma Nursing	2	6000	5500	469	430
Journal of Food Additives and Contaminants	2	6000	5500	430	391
Journal of Food Technology and Engineering	2	5500	5000	430	391
Journal of Forensic Chemistry and Toxicology	2	10000	9500	781	742
Journal of Global Medical Education and Research	2	6400	5900	500	461
Journal of Global Public Health	2	12500	12000	977	938
Journal of Microbiology and Related Research	2	9000	8500	703	664
Journal of Nurse Midwifery and Maternal Health	3	6000	5500	469	430
Journal of Orthopedic Education	3	6000	5500	469	430
Journal of Pharmaceutical and Medicinal Chemistry	2	17000	16500	1328	1289
Journal of Plastic Surgery and Transplantation	2	8000	7500	625	575
Journal of Psychiatric Nursing	3	6000	5500	469	430
Journal of Radiology	2	8500	8000	664	625
Journal of Social Welfare and Management	4	8000	7500	625	586
New Indian Journal of Surgery	6	8500	7500	664	625
Ophthalmology and Allied Sciences	3	6500	6000	508	469
Pediatric Education and Research	4	8000	7500	625	586
Physiotherapy and Occupational Therapy Journal	4	9500	9000	742	703
RFP Gastroenterology International	2	6500	6000	508	469
RFP Indian Journal of Hospital Infection	2	13000	12500	1016	977
RFP Indian Journal of Medical Psychiatry	2	8500	8000	664	625
RFP Journal of Biochemistry and Biophysics	2	7500	7000	586	547
RFP Journal of Dermatology (Formerly Dermatology International)	2	6000	5500	469	430
RFP Journal of ENT and Allied Sciences (Formerly Otolaryngology International)	2	6000	5500	469	430
RFP Journal of Gerontology and Geriatric Nursing	2	6000	5500	469	430
RFP Journal of Hospital Administration	2	7500	7000	586	547
Urology, Nephrology and Andrology International	2	8000	7500	625	586

Terms of Supply:

1. Agency discount 12.5%. Issues will be sent directly to the end user, otherwise foreign rates will be charged.
2. All back volumes of all journals are available at current rates.
3. All journals are available free online with print order within the subscription period.
4. All legal disputes subject to Delhi jurisdiction.
5. Cancellations are not accepted orders once processed.
6. Demand draft/cheque should be issued in favour of "**Red Flower Publication Pvt. Ltd.**" payable at **Delhi.**
7. Full pre-payment is required. It can be done through online (http://rfppl.co.in/subscribe.php?mid=7).
8. No claims will be entertained if not reported within 6 months of the publishing date.
9. Orders and payments are to be sent to our office address as given below.
10. Postage & Handling is included in the subscription rates.
11. Subscription period is accepted on calendar year basis (i.e. Jan to Dec). However orders may be placed any time throughout the year.

Order from

Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091 (India)
Mobile: 8130750089, Phone: 91-11-45796900, 22754205, 22756995, E-mail: sales@rfppl.co.in, Website: www.rfppl.co.in

RFP Journal of ENT and Allied Sciences

Corresponding address
Red Flower Publication Pvt. Ltd. 48/41-42
DSIDC, Pocket-II, Mayur Vihar Phase-I,
Delhi - 110 091(India)
Phone: 91-11-22754205/45796900,
Fax: 91-11-22754205
E-mail: info@rfppl.co.in
Web:www.rfppl.co.in

RFP Journal of ENT and Allied Sciences (Formerly Otolaryngology International) (ISSN: 2456-5024) is a peer-reviewed, journal that publishes original research articles, review articles, and clinical studies in all areas of otolaryngology. The journal also includes developments in otology, neurotology, audiology, rhinology, allergy, laryngology, speech science, bronchoesophagology, facial plastic surgery, and head and neck surgery.

Subscription Information

India
Institutional (1 year) (Print+Online): INR6000

Rest of the World
Insitutional (1 year) (Print+Online): $469

Payment instructions
Online payment link:
http://rfppl.co.in/payment.php?mid=15

Cheque/DD:
Please send the US dollar check from outside India and INR check from India made.
Payable to 'Red Flower Publication Private Limited'. Drawn on Delhi branch

Wire transfer/NEFT/RTGS:
Complete Bank Account No. 604320110000467
Beneficiary Name: Red Flower Publication Pvt. Ltd.
Bank & Branch Name: Bank of India; Mayur Vihar
MICR Code: 110013045
Branch Code: 6043
IFSC Code: BKID0006043 (used for RTGS and NEFT transactions)
Swift Code: BKIDINBBDOS

Send all Orders to: Subscription and Marketing Manager, Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110091(India), Phone: 91-11-45796900, 22754205, 22756995, E-mail: sales@rfppl.co.in, Website: www.rfppl.co.in

RFP Journal of ENT and Allied Sciences

July - December 2019
Volume 4, Number 2

Contents

Original Articles

Prospective Study of Myringoplasty in Children **41**
Dinesh Kumar Sharma, Sangeeta Aggarwal, Shalu Jindal, Babita Ramdev

Effectiveness of Diagnostic Nasal Endoscopy and Computed Tomography in the Diagnosis of Chronic Rhinosinusitis **47**
Nitin R Ankale, Rajesh Radhakrishna Havaldar, RN Patil

Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study **53**
Abdul Azeez Vallur

Comparison of Facial Nerve Injury and Recovery Rates after Antegrade and Retrograde Nerve Dissection in Superficial Parotidectomy Surgery for Benign Parotid Disease **57**
Hukam Singh

Guidelines for Authors **64**

Revised Rates for 2020 (Institutional) Title of the Journal	Frequency	India(INR) Print Only	India(INR) Online Only	Outside India(USD) Print Only	Outside India(USD) Online Only
Community and Public Health Nursing	3	6000	5500	469	430
Indian Journal of Agriculture Business	2	6000	5500	469	430
Indian Journal of Anatomy	4	9000	8500	703	664
Indian Journal of Ancient Medicine and Yoga	4	8500	8000	664	625
Indian Journal of Anesthesia and Analgesia	6	8000	7500	625	586
Indian Journal of Biology	2	6000	5500	469	430
Indian Journal of Cancer Education and Research	2	9500	9000	742	703
Indian Journal of Communicable Diseases	2	9000	8500	703	664
Indian Journal of Dental Education	4	6000	5500	469	430
Indian Journal of Diabetes and Endocrinology	2	8500	8000	664	625
Indian Journal of Emergency Medicine	4	13000	12500	1016	977
Indian Journal of Forensic Medicine and Pathology	4	16500	16000	1289	1250
Indian Journal of Forensic Odontology	2	6000	5500	469	430
Indian Journal of Genetics and Molecular Research	2	7500	7000	586	547
Indian Journal of Law and Human Behavior	3	6500	6000	508	469
Indian Journal of Legal Medicine	2	9000	8500	703	664
Indian Journal of Library and Information Science	3	10000	9500	781	742
Indian Journal of Maternal-Fetal & Neonatal Medicine	2	10000	9500	781	742
Indian Journal of Medical and Health Sciences	2	7500	7000	586	547
Indian Journal of Obstetrics and Gynecology	4	10000	9500	781	742
Indian Journal of Pathology: Research and Practice	6	12500	12000	977	938
Indian Journal of Plant and Soil	2	7000	6500	547	508
Indian Journal of Preventive Medicine	2	7500	7000	586	547
Indian Journal of Research in Anthropology	2	13000	12500	1016	977
Indian Journal of Surgical Nursing	3	6000	5500	469	430
Indian Journal of Trauma and Emergency Pediatrics	4	10000	9500	781	742
Indian Journal of Waste Management	2	10000	9500	781	742
International Journal of Food, Nutrition & Dietetics	3	6000	5500	469	430
International Journal of Forensic Science	2	10500	10000	820	781
International Journal of Neurology and Neurosurgery	4	11000	10500	859	820
International Journal of Pediatric Nursing	3	6000	5500	469	430
International Journal of Political Science	2	6500	6000	508	469
International Journal of Practical Nursing	3	6000	5500	469	430
International Physiology	3	8000	7500	625	586
Journal of Animal Feed Science and Technology	2	8300	7800	648	609
Journal of Cardiovascular Medicine and Surgery	4	10500	10000	820	781
Journal of Emergency and Trauma Nursing	2	6000	5500	469	430
Journal of Food Additives and Contaminants	2	6000	5500	430	391
Journal of Food Technology and Engineering	2	5500	5000	430	391
Journal of Forensic Chemistry and Toxicology	2	10000	9500	781	742
Journal of Global Medical Education and Research	2	6400	5900	500	461
Journal of Global Public Health	2	12500	12000	977	938
Journal of Microbiology and Related Research	2	9000	8500	703	664
Journal of Nurse Midwifery and Maternal Health	3	6000	5500	469	430
Journal of Orthopedic Education	3	6000	5500	469	430
Journal of Pharmaceutical and Medicinal Chemistry	2	17000	16500	1328	1289
Journal of Plastic Surgery and Transplantation	2	8000	7500	625	575
Journal of Psychiatric Nursing	3	6000	5500	469	430
Journal of Radiology	2	8500	8000	664	625
Journal of Social Welfare and Management	4	8000	7500	625	586
New Indian Journal of Surgery	6	8500	7500	664	625
Ophthalmology and Allied Sciences	3	6500	6000	508	469
Pediatric Education and Research	4	8000	7500	625	586
Physiotherapy and Occupational Therapy Journal	4	9500	9000	742	703
RFP Gastroenterology International	2	6500	6000	508	469
RFP Indian Journal of Hospital Infection	2	13000	12500	1016	977
RFP Indian Journal of Medical Psychiatry	2	8500	8000	664	625
RFP Journal of Biochemistry and Biophysics	2	7500	7000	586	547
RFP Journal of Dermatology (Formerly Dermatology International)	2	6000	5500	469	430
RFP Journal of ENT and Allied Sciences (Formerly Otolaryngology International)	2	6000	5500	469	430
RFP Journal of Gerontology and Geriatric Nursing	2	6000	5500	469	430
RFP Journal of Hospital Administration	2	7500	7000	586	547
Urology, Nephrology and Andrology International	2	8000	7500	625	586

Terms of Supply:

1. Agency discount 12.5%. Issues will be sent directly to the end user, otherwise foreign rates will be charged.
2. All back volumes of all journals are available at current rates.
3. All journals are available free online with print order within the subscription period.
4. All legal disputes subject to Delhi jurisdiction.
5. Cancellations are not accepted orders once processed.
6. Demand draft/cheque should be issued in favour of "**Red Flower Publication Pvt. Ltd.**" payable at **Delhi.**
7. Full pre-payment is required. It can be done through online (http://rfppl.co.in/subscribe.php?mid=7).
8. No claims will be entertained if not reported within 6 months of the publishing date.
9. Orders and payments are to be sent to our office address as given below.
10. Postage & Handling is included in the subscription rates.
11. Subscription period is accepted on calendar year basis (i.e. Jan to Dec). However orders may be placed any time throughout the year.

Order from

Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091 (India)
Mobile: 8130750089, Phone: 91-11-45796900, 22754205, 22756995, E-mail: sales@rfppl.co.in, Website: www.rfppl.co.in

Prospective Study of Myringoplasty in Children

Dinesh Kumar Sharma[1], Sangeeta Aggarwal[2], Shalu Jindal[3], Babita Ramdev[4]

How to cite this article:
Dinesh Kumar Sharma, Sangeeta Aggarwal, Shalu Jindal et al. Prospective Study of Myringoplasty in Children. RFP J ENT Allied Sci. 2019;4(2):41–45.

Author Affiliation: [1,2]Assistant Professor, Department of ENT, Government Medical College, & Rajindra Hospital, Patiala, Punjab 147001, India. [3]Consultant, AP Healthcare and Trauma Centre, Patiala, Punjab 147001, India. [4]Associate Professor, Department of Anesthesia, Maharishi Markandeshwar Institute of Medical Sciences and Research, Maulana, Ambala, Haryana 133207, India.

Corresponding Author: Aggarwal Sangeeta, Assistant Professor, Department of ENT, Government Medical College, & Rajindra Hospital, Patiala, Punjab 147001, India.

E-mail: sangeeta_5339@yahoo.co.in

Received on 21.11.2019; **Accepted on** 19.12.2019

Abstract

Objectives: To observe the surgical outcome of myringoplasty in children in terms of graft uptake and improvement in hearing. *Materials and Methods:* The prospective study was conducted on 30 children of either sex upto the age of 15 years both from urban and rural population irrespective of socioeconomic status and was conducted in Department of ENT, Government Medical College and Rajindra Hospital, Patiala. All the patients had central perforation and dry ear having duration of atleast 6 weeks. The myringoplasty was performed under either general anesthesia or local anesthesia, using either per meatal or post auricular approach Patients were followed up in post operative period at 4th, 8th and 12th weeks for any complication, assessment of graft status and audiological evaluation. *Results:* Out of 30 patients taken for myringoplasty, 17 (56.7%) were males and 13 (43.3%) were females. 70% of the patients were from rural background and 30% were from urban area. The mean age was 13.6 ± 1.49 years with majority (76.66%) of the patients in 13–15 years age group, while 7 patients (23.33%) were in the 9–12 years age group. In this study, successful graft uptake was seen in 24 (80%) cases while 6 (20%) cases had graft rejection and all successful patients had improvement in hearing ranging from 20dB to 30dB. *Conclusion:* Myringoplasty is safe and effective and can be performed in pediatric population regardless of age, location and type of perforation.

Keywords: Chronic otitis media; Myringoplasty; Central perforation.

Introduction

Myringoplasty is an effective and simple procedure for the closure of tympanic membrane perforations. Tympanic membrane perforations can occur due tochronic suppurative otitis media in young children, trauma from direct physical injury or head injury, iatrogenic damage by inserting ventilating tube.[1] Rupa et al. (1999) in a study on 914 children of age group 2–10 years found the overall prevalence of csom to be 6%.[2] This infection is associated with chronic hearingloss, and may have an impacton development of speech, language, cognition and school performance of pediatric population and carry the potential risk of life-threatening suppurative complications.[3]

Chances of developing acute suppurative otitis media are more in children because they have not yet achieved adult immunity to the respiratory tract infections, leading to perforation of tympanic membrane. With recent trends, otorhinol aryngologists dedicated to pediatric pathology have started considering it necessary to manage chronic ear infections at an early age. Ear drops containing antimicrobial agents either with or without an anti-inflammatory component have been promoted as an effective therapy for COM since the 1950s.[4–6]

Following medical management, children whose discharge resolves but the perforation becomeschronic should be informed about the hazards of water contamination and the disease sequelae. Closing of tympanic membrane perforation prevents contamination of middle ear. It also maintains or improves hearing and decreases tinnitus thus reducing economic and social disability.

The heterogeneous approach to the management of these children indicates alack of standardised management guidelines and probably misunderstanding amongst parents. Myringoplasty in children continues to be a contentious issue. Many surgeons favour myringoplasty in children and find principles of surgery to be same as in adults while others find it to be more difficult and results to be uncertain.

Although there is no consensus among otologists regarding benefits of myringoplasty in children, but the benefits of operating early in a child are as: 1) To prevent the chronic ear disease and its related complications, 2) To improve hearing and thus optimizing one of the conditions for speech and language development, 3) To let the child enjoy water activities etc (Kessler et al., 1994).[7]

However, much debate exists over the management of COM in children, majority of it being centred around the surgical management. High rates of closure can be achieved no matter at what age surgery is undertaken but there is an increased risk, compared to adults, of subsequent perforation with the next episode of otitis mediain younger children. In children, poor Eustachian tube function and recurrent upper respiratory tract infection can lead to increased rate of failure of myringoplasty (Dhingra, 2007).[8]

Though numerous studies are mentioned on the subject in literature, but in the absence ofprospective studies it is always difficult to draw definitive conclusions. Keeping all this in view, the present study was designed to know the usefulness of myringoplasty in children and is undertaken to 1) evaluate graft uptake in children 2) evaluate the hearing improvement after myringoplasty in children 3) determine the causes of failure of myringoplasty in children.

Materials and Methods

The Study was conducted on 30 children of either sex upto the age of 15 years both from urban and rural population irrespective of socioeconomic status and was conducted in Department of ENT, Government Medical College and Rajindra Hospital, Patiala after approval from the Institutional Ethical Committee. All the patients had central perforation and dry ear having duration of atleast 6 weeks, mild to moderate conductive hearing loss, normal cochlear functions, normal or good Eustachian tube function, no evidence of infection in nose, paranasal sinuses, nasopharynx and throat.

All the patients selected were evaluated based on history, general physical examination as well as complete ear, nose and throat examination. Written consent from each of the patients was obtained. Detailed history of patient included history of adenoidectomy or tonsillectomy, history of ventilation tube placement and otoscopic findings were recorded. Examination under microscope was done in all the cases. Tuning fork tests and pure tone audiogram were done for preoperative assessment and to confirm degree and type of hearing loss.

Surgical Procedure

The operation was performed under either general anesthesia or local anesthesia, using either permeatal or post auricular approach depending upon the size, shape of EAC and site and size of perforation. After harvesting the temporalis fascia graft, the middle ear was examined for any pathology. Graft was placed by underlay technique. Patients were observed for graft up take and for any complications at 4th 8th and 12th week of operation. PTA was done three months after surgery to assess the hearing and was compared with that of preoperative audiogram. Any factors contributing to the failure of the graft uptake were also noted.

The criteria for Surgical success was 1) integrity of the graft or membrane; 2) postoperative improvement of hearing. Residual perforations were regarded as treatment failure.

Results

Out of 30 patients taken, 17 (56.7%) were males and 13 (43.3%) were females. 70% of the patients were from rural background and 30% were from urban area. The mean age was 13.6 ± 1.49 years with majority (76.66%) of the patients in 13–15 years age group, while 7 patients (23.33%) were in the

9–12 years age group. Contralateral ear was involved in 18 (60%) cases. 12 (40%) cases had unilateral ear disease out of which 5 patients had right ear disease while 7 patients had left ear disease. The duration of discharge was more than 8 years in 14 patients while 6 patients had duration of 5–8 years. All the patients had dry ear prior to surgery ranging from 1–24 months. In our study, majority 16 (53.3%) of the patients had subtotal perforation while anterior quadrant and posterior quadrant involvement was seen in 6 (20%) and 8 (26.7%) cases respectively. Mean pre operative AB gap was 29.90 with SD of 9.10.

Left ear was operated upon in 14 (46.7%) cases while right ear was operated in 16 (53.3%) cases. Majority (83.4%) of the patients were operated through post-aural approach. Successful graft uptake was seen in 24 (80%) cases while 6 (20%) cases had graft rejection.

Success of graft uptake was 71.42% in 9–12 years age group and 13–15 years age group showed 82.60% success rate of graft uptake.

The 14 patients who had duration of discharge of more than 8 years showed graft uptake in 10 (71.4%) cases while 6 patients who had duration of 5–8 years showed 83.3% successful graft uptake. Children with dry ear for more than 1 year showed 100% graft uptake and those who had dry ear for less than 1 year showed success rate ranging from 70%–81.8%.

Graft uptake was found in 75% of the cases with posterior quadrant perforation and in 66.6% of the cases with anterior quadrant perforation while cases with subtotal perforation had success rate of 87.5%. Out of successful 24 cases, 16 cases (66.6%) had post operative hearing improvement of less than 20 dB while 4 cases (16.6%) had hearing improvement of 20–30 dB and more than 30 dB hearing improvement was also seen in 4 cases (16.6%). In none of the patients, sensory neural hearing loss was observed post operatively.

Post operatively vascularization, texture and motility of tympanic membrane was observed. Only two children (8.33%) presented with intact but non mobile and thickened graft. Medialization of anterior part of graft was seen in two children (8.3%).

Discussion

Chronic suppurative otitis media is a persistent disease capable of causing destruction of middle ear structure with irreversible sequalae which manifests as deafness and discharge (PM Shenoi, 1987).[9]

Myringoplasty is an effective and simple procedure for the closure of tympanic membrane perforations. In children early type-I tympanoplasty had a good chances of restoring function with the potential for reducing further complications and deterioration (PM Shenoi, 1987).[9]

There are controversies regarding age for myringoplasty in children. Robert et al., (1994) recommended postponing myringoplasty in children until age of 7 years as rates of reperforation are higher due to recurrent otitis media and eustachian tube dysfunction.[10] Glasscock (1976) gave young age as relative contraindication to tympanoplasty because children younger under the age of 3 to 4 years were prone to respiratory tract infections and recurrent attacks of otitis media.[11] Raine and Singh (1983) recommended waiting upto 12 years of age as success of myringoplasty in children improved with age.[12] Lau & Tos (1986)

Table 1: Factors Influencing Success Rate

Contributing Factors		Success Rate (%)
Age Group (Years)	9–12	71.42
	13–15	81.60
Duration of discharge (Years)	<1	100
	1–4	87.5
	5–8	83.3
	>8	71.4
Duration of dry ear (months)	1–4	70
	5–8	81.8
	9–12	75
	>12	100
Site of perforation	Subtotal	87.5
	Anterior	66.6
	Posterior	75
Status of non-operated ear	Dry	75
	Wet	83.5

found no significant difference in outcome between the age of 2 to 7 age group and those children aged between 8 to 14 years. They suggested that early operation may prevent progression of ossicular chain resorption.[13] Ophir et al., (1987) reported 79% overall success rate, and their success in younger children (5–8) was comparable to the success rate for older children. So, they concluded that myringoplasty had a good chance of success at any age.[14]

Koch et al., (1990) reported an 81% success rate for children age 8 and older, but only 9.30% success rate in younger patients. They concluded that tympanoplasty before the age 8 results in a high rate of failure because of Eustachian tube dysfunction and frequent upper respiratory tract infections.[15]

Yung et al., (2007) analysed the myringoplasty in 51 children aged 4 to 13 years to examine this success rate in young and older. The graft uptake rate was 83.8%. They found no difference in outcome in young and older children.[16]

In the present study, graft uptake was seen in 24 cases (80%) out of total 30 patients. In 9 to 12 years age group, 71.42% and in 13 to 15 years age group 82.60% success was achieved. Thus, as the age advances, the chances of success of myringoplasty also improve.

Table 2:

Sr. No.	Source, Author, Year	No. of ears operated	Age group years (no. of patients)	Success %
1.	Blanshard et al., 1990[17]	59	7–14	78
2.	Koch et al., 1990[15]	64	< 8 8–17	30 81
3.	Ghosh and Dubey 1991[18]	32	5–12 5–8 9–12	60 72.7
4.	Kesseler et al., 1994[7]	100	0–18 0–6 (18) 6–12 (63) 13–18 (19)	81 88 90
5.	Chandrasekhar et al., 1995[19]	226	0–19	84.9
6.	Umpathy and Dekker 2003[20]	51	9–14	92
7.	Yung et al., 2007[16]	51	4–13	83.8

The outcome of myringoplasty depends on the criteria for selection and length of follow up. This is the main reason for widely differing rates.

Koch et al. (1990) reported improvement in the hearing upto 30 dB in 64% cases.[15] Kesseler et al. (1994) achieved post operative AB gap of less than 20 dB in 93% cases.[7] Skotnicka B (2008) in a study of 71 children, obtained AB gap between 0 to 20 dB in 95.6% of the patients.[21] Raine and Singh (1983) in their study achieved post operative AB gap of less than 30 dB in 82% patients[12] while Ophir et al. (1987) achieved hearing improvement between 84% to 90%. Thus, the hearing improvement in the present study is in accordance with the above mentioned studies.[14]

In the present study, postoperatively 60% patients had AB gap less than 20 dB and 33.3% had AB gap between 20-30 dB. Less than 20 dB improvement was noted in 16 (66.66%) cases while 4 cases (16.66%) had shown improvement of 20-30 dB and 16.66% had shown more than 30 dB improvement in hearing.

Conclusion

In our study, the success rate of myringoplasty in children aged 9–15 years is 80% with good improvement in hearing. Thus, myringoplasty is a beneficial procedure in the children and can be performed safely, especially in children having both ears perforation. In such children where there is increased hearing loss and it prevents the mental development, a successful myringoplasty will reduce the enormous degree of economic and social disability.

References

1. Rafi T. Tympanoplasty in children:A study of 30 cases. J Surg Pak 2001;6:11–12.
2. Rupa V, Jacob A, Joseph A. Chronic suppurative otitis media: prevalence and practices among rural South Indian children. Int J Pediatr Otorhinolaryngol 1999;25;48(3):217–21.
3. Bluestone CD. Epidemiology and pathogenesis of chronic suppurative otitis media: implications for prevention and treatment. International journal of pediatric otorhinolaryngology 1998;42(3):207–23.
4. Myer CM III. Historical perspective on the use of oticantimicrobial agents, Pediatr. Infect Dis. J. 2001;20(1):98–101.
5. Palomar GV and Palomar AV. Are some ear drops ototoxic orpotentially ototoxic Acta. Otolaryngol. 2001;121(5):565–68.
6. Smith AW, Hatcher J, Mackenzie IJ, Thompson S, Bal I, Macharia I, et al. Randomised controlled trial of treatment of chronic suppurative otitis media in Kenyan school children. The Lancet 1996;348(9035):1128–33.
7. Kessler A, William P. Potsic, Roger R. Marsh. Type 1

Tympanoplasty in Children. Arch Otolaryngol Head Neck Surg 1994;120(5):487–90.

8. Dingra PL. Eustachian tube and its disorders in text book of Diseases of Ear Nose and Throat. Elsevier 2007;4:56–60.
9. PM Shenoy. Management of chronic suppurative otitis media. Scott Brown Otolaryngology 1987;3(5)10:215.
10. Robert R. MacDonald, Rodney P. Lusk, Harlan R. Muntz. Fasciaform Myringoplasty in Children. Arch Otolaryngol Head Neck Surg. 1994;120(2):138–43.
11. Glasscock ME. Symposium. contraindications to tympanoplasty, II: an exercise in clinical judgement. The Laryngoscope 1976;86–70–76.
12. Raine CH and Singh SD. Tympanoplasty in children, A review of 144 cases. Journal of Laryngology and Otology 1983;97:217–21.
13. Lau T and Tos M. Tympanoplasty in children: an analysis of late results. Amm J Otol 1986;7:55–59.
14. Ophir D, Porat M, Marshak G, Myringoplasty in pediatric population, Arch Otolaryngol Head Neck Surg 1987;113(12):1288–90.
15. Koch WM, Friedman EM, McGill TJ, Healy GB. Tympanoplasty in children. The Boston Children's Hospital experience. Arch Otolaryngol Head Neck Surg 1990;116(1):35–40.
16. Yung M, Neumann C, Vowler Sl, A longitudinal study on pediatric myringoplasty, Otol Neurotol 2007;28(3):353–5.
17. Blanshard JD, Robson AK Smith I, Maw AR. A long term view of myringoplasty in children. The Journal of Laryngology and Otology 1990;104(10):758–62.
18. Ghosh LM, Dubey SP, Paediatric myringoplasty in India, AurisNasus Larynx 1991;18(3):209–13.
19. Chandrasekhar SS, John W. House, Uday Devgan. A 10-Year Experience. Arch Otolaryngol Head Neck Surg 1994;121(8):873–78.
20. Umapathy N, Dekker PJ, Myringoplasty: is it worth performing in children, Arch Otolaryngol Head Neck Surg 2003;129(10): 1053–55.
21. Skotnicka B, Hassmann-Poznanska E. Myringoplasty in children-success factors, Otolaryngol Pol 2008;62 (1):65–70.

RFP Journal of ENT and Allied Sciences

Library Recommendation Form

If you would like to recommend this journal to your library, simply complete the form given below and return it to us. Please type or print the information clearly. We will forward a sample copy to your library, along with this recommendation card.

Please send a sample copy to:

Name of Librarian

Name of Library

Address of Library

Recommended by:

Your Name/ Title

Department

Address

Dear Librarian,

I would like to recommend that your library subscribe to the RFP Journal of ENT and Allied Sciences. I believe the major future uses of the journal for your library would provide:

1. Useful information for members of my specialty.
2. An excellent research aid.
3. An invaluable student resource.

I have a personal subscription and understand and appreciate the value an institutional subscription would mean to our staff.

Should the journal you're reading right now be a part of your University or institution's library? To have a free sample sent to your librarian, simply fill out and mail this today!

Stock Manager
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India)
Phone: Phone: 91-11-45796900, 22754205, 22756995, Cell: +91-9821671871
E-mail: sales@rfppl.co.in

Effectiveness of Diagnostic Nasal Endoscopy and Computed Tomography in the Diagnosis of Chronic Rhinosinusitis

Nitin R Ankale[1], Rajesh Radhakrishna Havaldar[2], RN Patil[3]

How to cite this article:
Nitin R Ankale, Rajesh Radhakrishna Havaldar, RN Patil. Effectiveness of Diagnostic Nasal Endoscopy and Computed Tomography in the Diagnosis of Chronic Rhinosinusitis. RFP J ENT Allied Sci. 2019;4(2):47–51.

Author Affiliation: [1]Professor, [2]Senior Resident, Department of ENT and HNS, J.N. Medical College, Kaher, Belagavi, Karnataka 590010, India. [3]Professor, Department of ENT and HNS, USM-KLE International Medical Programme, Belagavi, Karnataka 590010 India.

Corresponding Author: Rajesh Radhakrishna Havaldar, Senior Resident, Department of ENT and HNS, J.N. Medical College, KAHER, Belagavi, Karnataka 590010, India.

E-mail: rajeshhavaldar@yahoo.com

Received on 26.11.2019; **Accepted on** 30.12.2019

Abstract

Chronic rhinosinusitis (CRS) is a frequently encountered condition in clinical practice. Diagnostic endoscopy and Computed Tomography (CT) are imperative in the evaluation of CRS. The reliability of each of these to predict the operative findings in chronic sinusitis is important. *Method:* Cross sectional study in which 30 patients of CRS were included. 20 patients needed bilateral surgery. Hence, a total of 50 procedures were done. *Results:* Diagnostic endoscopy findings correlated very well with the operative findings for all parameters without any false positives or false negatives. Sensitivity of CT was found to be good for almost all the parameters except for anterior ethmoids. The specificity of CT was found to be good for all the parameters except maxillary sinus. *Conclusions:* Systematic diagnostic endoscopy is the best way forward to evaluate and objectively confirm CRS with CT scan being supplemented only in cases where gross anatomical/ pathological disease restricts visualisation of the disease.

Keywords: Chronic rhinosinusitis; Diagnostic nasal endoscopy; Computed tomography.

Introduction

Chronic rhinosinusitis (CRS) is a frequently encountered condition in clinical practice. It causes significant morbidity and thus affects the economic productivity of a country. Nearly 50 million people are affected each year and thus it is a frequently encountered challenge to most clinicians.[1]

The symptoms of chronic sinus disease are multiple, often vague and non specific, while physical examination is limited as the sinuses cannot be examined directly. Thus the importance of a diagnosis plays a significant role in the management. In 2007, American academy of Otorhinolaryngology—Head and Neck Surgery (AAO-HNS) published guidelines which involve a combination of symptom criteria and objective findings. Objective measures on endoscopy such as nasal polyps or purulence in the middle meatus and radiological evidence of mucosal disease are also important contributory aids.[2-4] Anterior rhinoscopy reveals little information about the middle meatal cleft and no information regarding the infundibular opening and maxillary sinus orifice. Nasal endoscopy provides the ability to accurately access these areas for evidence of localized disease, or for anatomical defects that compromise ventilation and mucociliary clearance.

Computed Tomography provides a method for effectively demonstrating the mucosal changes and the various disease patterns in the sinuses in addition to complications. Subtle anatomical variations and imaging of the posterior ethmoid and sphenoid sinus are imaged with a level of clarity not afforded previously by standard sinus radiograph.

Nasal endoscopy helps in assesing the osteomeatal complex as well as anatomical variations which impair normal aeration and mucociliary clearance of the sinuses. Therefore both these tools are imperative in the evaluation and preoperative planning of a patient for functional endoscopic sinus surgery.[5]

Aims and Objectives

To determine the reliability of nasal endoscopy and computed tomography to predict the operative findings in the evaluation of chronic sinusitis.

Materials and Methods

Source of data: All patients attending the ENT out patient department of a tertiary care centre with proved upper respiratory tract infection with sinusitis for more than three months duration and not responding to the full course of antibiotics analgesics and decongestant. In addition to the above the patients were willing to undergo Functional Endoscopic Sinus Surgery and participate in the study.

Sample Size: 30 patients. Out of these, 20 patients needed bilateral surgery Thus a total of 50 procedures were carried out.

Study type: Cross Sectional Study

Results

The correlation of diagnostic endoscopic, computed tomographic and operative findings is as shown in the tables (Table 1 and Table 2 respectively).

As the total number of procedures that were carried out in this study were 50 all the confirmed operative findings of 50 sides are available (and 47 sides for posterior ethmoid and 27 for sphenoids). Only the parameters confirmed at operation of being normal or abnormal were correlated with the diagnostic endscopy and computed tomography scan.

The diagnostic endoscopy findings correlated very well with the operative findings for all parameters without any false positives or false negatives.

Diagnostic endoscopy was found to be the most sensitive investigation for hiatus semilunaris, sphenoethmoid recess and frontal recess with sensitivity of 94.73%, 100% and 90% respectively. While the specificity of these parameters were 53.59%, 79.19% and 91.71%, and the negative predictive valuee are 93.75%, 100%, 93.93%

Table 1: Correlation of diagnostic endoscopic, computed tomographic and operative findings

	Diagnostic Endoscopy					Computed Tomography				Operative findings	
	N	Abn	F +ve	F -ve	NV	N	Abn	F +ve	F -ve	N	Abn
Inferior Turbinate	43	7	0	0	0	43	7	0	0	43	7
Middle Turbinate	19	26	0	0	5	20	30	0	0	20	30
Septum	22	8	0	0	0	22	8	0	0	22	8
Inferior Meatus	45	5	0	0	0	45	5	0	0	45	5
Middle Meatus	14	33	0	0	3	12	38	5	0	17	33
Uncinate	14	29	0	0	7	14	34	0	0	14	34
Hiatus semilunaris	18	19	0	0	13	6	44	13	1	18	32
Bulla ethmoidalis	15	13	0	0	22	14	36	6	5	15	35
Sphenoethmoid recess	16	2	0	0	22	31	19	0	5	26	24
Frontal recess	25	18	0	0	7	27	23	3	5	25	25
Aggernasi cells	18	13	0	0	7	18	20	0	0	18	20
Haller cells	–	–	–	–	50	1	1	0	0	1	1
Accessory maxillary ostium	0	4	0	0	1	0	5	0	0	0	5
Anterior ethmoids	–	–	–	–	50	21	29	0	13	8	42
Maxillary sinus	–	–	–	–	50	10	40	3	2	11	39
Posterior ethmoids	–	–	–	–	50	25	22	2	1	26	21
Sphenoid	–	–	–	–	50	14	13	1	2	13	14

Legend: N- Normal Abn- Abnormal F +ve- False Positive F-ve- False Negative NV- Not visualised respectively. As all the three parameters considered are the key areas where all the major sinuses drain, it can be inferred that diagnostic endoscopy can be definitely used as a very sensitive tool towards diagnosing the infection in the adjacent sinuses. These parameters were lower for the middle turbinate, middle meatus and bulla ethmoidalis. Although they did correlate with the CT findings but not as well as the frontal recess, hiatus semilunaris and sphenoethmoid recess.

On Endoscopy, in addition to gross findings such as pathologic discharge, subtle evidence of disease in the osteomeatal area may be identified. Prolapsed mucosa in the infundibulum is evidence of disease in the anterior ethmoid. An inflammed bulla is also an evidence of disease in this area. Mucosal edema or polypoidal mucosa in the area of attachment of the middle turbinate anteriorly suggests disease in the frontal recess. In addition, the lateral nasal wall is thin in the area of the fontanelles and the infundibulm, and disease behind these structures may be reflected in edema or erythema at these sites.

From Table 2, amongst various parameters that were correlated, the sensitivity was found to be good for almost all the parameters except for anterior ethmoids.The specificity was found to be good for almost all the parameters except for maxillary sinus.

Similarly, negative predictive value of CT scan was good for maxillary sinus, frontal recess, posterior ethmoids and sphenoid but not for anterior ethmoids. These values also suggest that the disease in the anterior ethmoids is much more than what is shown by CT.

Discussion

The computed tomography findings correlated well with the confirmed findings at operation but there were a significant number of false positives and false negatives. The coronal section CT scans

Table 2: Correlation of Computed Tomography (CT) findings with Operative (O) findings:

	Anterior Ethmoids	Maxillary Sinus	Frontal Recess	Maxillary Ostium	Posterior Ethmoids	Sphenoid Sinus
Normal [CT(N)+O(N)]	8	8	22	4	24	12
Abnormal [CT(A)+O(A)]	29	37	20	39	20	12
False Positive [CT(A)+O(N)]	0	3	3	3	2	1
False Negative [CT(N)+O(A)]	13	2	5	4	1	2
Sensitivity	69.04%	94.87%	80%	90.69%	95.23%	85.71%
Specificity	100%	72.72%	88%	57.14%	92.30%	92.30%
Positive Predictive Value	100%	92.5%	86.95%	92.85%	90.90%	92.30%
Negative Predictive Value	38.09%	80%	81.48%	50%	96%	85.71%

Legend: DE – Diagnostic Endoscopy CT – Computed Tomography A – Abnormal N – Normal
O – Operative findings

Bullet Point Summary

- Nasal endoscopy provides the ability to accurately access critical areas for evidence of localized disease, or for anatomical defects that compromise ventilation and mucociliary clearance.
- Computed Tomography provides a method for effectively demonstrating the mucosal changes and the various disease patterns in the sinuses in addition to complications.
- Both these tools are imperative in the evaluation and preoperative planning of a patient for functional endoscopic sinus surgery.
- Disease in the anterior ethmoids is much more than what is shown by CT.
- Systematic diagnostic endoscopy is the best way forward to evaluate and objectively confirm the intranasal pathology with good sensitivity and specificity for diagnosing the disease with CT scan being supplemented only in cases of high index of suspicion of intrasinus pathology and in cases where variations and vital relations of the paranasal sinuses impede the visualisation of the disease completely.

provided most of the information required for an endoscopic clearance.

After the correlation of the state of sinuses in CT scans with the operative findings, it was noted that in some cases the sinuses showed presence of disease when CT scan showed normal sinuses (False negatives). Possible reasons could be the variable nature of sinus disease, time lag between the CT imaging and the surgery where in the patient might have had another episode of acute sinusitis in this period, inability of the CT to recognize minimal changes in the mucosa window and possibly width in our study which was 5 mm.

A few cases showed no disease at surgery while CT showed an abnormal sinus (False positive). Possible explanation could be remission of the disease as all patients received preoperative medical therapy. Another possibility would be the inability of the CT to differentiate between fibrous tissue and inflammatory mucosal disease.

These were also observed by Katsantomis et al.[6] in cases of revision surgery. Havas[7] et al. found mucosal abnormalities in atleast one of the paranasal sinuses in 42.5% of patients. Bolger[8], Butzin Parsons found that in patients scanned for non sinusitis reasons, the maxillary sinus was the most frequently affected region.

Considering all the above factors, a well controlled coronal plane CT investigation of subjects who lack evidence of sinus disease by a standard comprehensive history and nasal endoscopic examination is needed to understand more clearly the background prevalence of mucosal anormalities on CT scan.

Regardless of the cause, the high prevalence of mucosal anormalities noted on scan must be considered when evaluating patient with chronic sinus complaints to avoid a false positive diagnosis of sinusitis. It is imperative that a thorough evaluation be conducted, which includes a detailed clinical history as well as a nasal endoscopic examination. The CT scan should not be used exclusively to diagnose chronic sinusitis or to determine the need for surgery, rather, it should be used to provide supplementary clinical data to the history and endoscopic examination, and assist in directing surgical treatment to the affected areas.

Diagnostic endoscopy was found to be most sensitive investigation for the hiatus semilunaris, sphenoethmoid recess and frontal recess. Since these are the key areas where most of the sinuses drain, it can be inferred that diagnostic endoscopy can be definitely used as a very sensitive tool towards diagnosing the infection in the adjacent sinuses, the only limitation being the presence of gross pathology or severe anatomical abnormality that makes it impossible to pass the endoscope beyond a certain point.

Rosbe and Jones[9] in 1998 compared nasal endoscopy, CT scan and a symptom questionnaire and found that in 91% of patients in whom endoscopy revealed presence of disease, the computed tomography was also suggestive of CRS.

In a study done by Stankiewicz and Chow[10] on 78 patients with CRS in 2002, the correlation between nasal endoscopy, computed tomography and symptoms was done and it was found that the sensitivity of endoscopy as compared with CT was 46%, specificity was 86%, PPV was 74%, and NPV was 64%. There was a stronger association between a negative endoscopy and CT findings, showing a 78% correlation with CT that was negative or showed minimal sinus disease.

In a study done by Bhattacharyya and Lee[11] in 2010, 202 patients of CRS were prospectively evaluated. Endoscopy also improved the positive predictive value from 39.9% to 66.0%, and negative predictive value from 62.5% to 70.3%. In additon to this, endoscopy also significantly improved the specificity from 12.3% to 84.1% respectively.

The associations between symptom based criteria as well as endoscopy and CT results was evaluated by Ferguson et al.[12] The sensitivity of endoscopy was 24% and specificity was 100%. Hence, it was concluded that endoscopy is a useful tool for the confirmatory diagnosis and not for ruling the disease out.

The importance of nasal endoscopy is further reiterated by the study done by Vining et al.[13] wherein it was observed that in cases with positive computed tomography findings, nasal endoscopy was useful in getting a clear picture of the type of soft tissue blocking the middle meatus. Further, in patients wherein a comuted tomography showed no significant findings, nasal endoscopy demonstrated deviated nasal septum, middle meatal edema as well as hypertrophied adenoids and turbinates.

Conclusion

Diagnostic nasal endoscopy was found to be a very good tool for the evaluation of patients of CRS with a very good sensitivity and specificity for all parameters studied except those areas which could not be accessed due to gross anatomical/ pathological changes.

Computed tomography was also effective for evaluation of CRS with very good sensitivity for all sinuses except the anterior ethmoids and specificity was good for all sinuses except for the maxillary sinus.

Hence, both diagnostic endoscopy and computed tomography imaging of the paranasal sinuses are important preoperative evaluation tools in detecting pathology and both are complementary to each other. Systematic diagnostic endoscopy is the best way forward to evaluate and objectively confirm the intranasal pathology with good sensitivity and specificity for diagnosing the disease; with CT scan being supplemented only in cases of high index of suspicion of intrasinus pathology and in cases where variations and vital relations of the paranasal sinuses impede the visualisation of the disease completely.

Funding: None

Ethical Approval: The permission was taken from Institutional Ethics Committee prior to starting the project. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

1. Battacharyya N. Computed tomographic staging and the fate of dependent sinuses in revision endoscopic sinus surgery. Arch Otolaryngol Head Neck Surg 1999;125:994–999. doi: 10.1001/archotol.125.9.994
2. Benninger MS, Ferguson BJ, Hadley JA, et al. Adult chronic rhinosinusitis: definitions, diagnosis, epidemiology, and pathophysiology. Otolaryngol Head Neck Surg 2003;129(3 Suppl):S1–S32.
3. Hopkins C, Brown JP, Slack R. The Lund-Mackay staging system for chronic rhinosinusitis: how is it used and what does it predict? Otolaryngol Head Neck Surg 2007;137(4):555–561. doi:10.1016/j.otohns.2007.02.004.
4. Rosenfeld RM, Richard M, Andes D, et al. Clinical practice guideline: adult sinusitis. Otolaryngol Head Neck Surg 2007;137(3 Suppl):S1–S31. doi:10.1016/j.otohns.2007.06.726.
5. Deosthale NV, Khadakkar SP, Harkare VV et al. Diagnostic accuracy of nasal endoscopy as compared to computed tomography in chronic rhinosinusitis. Indian J Otolaryngol Head Neck Surg 2017;69:494–99.
6. Katsantomis et al. The rore of CT in revision sinus surgery. Laryngoscope 1990;100:811–16.
7. Havas TE, Motbey JA, Gullane PJ. Prevalence of incidental abnormalities of a CT scan of PNS. Arch. Otol. Laryngol, 1998;114:856–59.
8. Bolger WE, Butzin CA, Parsons DS. Paranasal sinus bony anatomic variations and mucosal abnormalities: CT analysis for endoscopic sinus surgery. Laryngoscope. 1991 Jan;101(1 Pt 1):56–64.
9. Rosbe KW, Jones KR. Usefulness of patient symptoms and nasal endoscopy in the diagnosis of chronic sinusitis. Am JRhinol 1998;12(3):167–171. doi:10.2500/105065898781390208.
10. Stankiewicz JA, Chow JM. Nasal endoscopy and the definition and diagnosis of chronic rhinosinusitis. Otolaryngol Head Neck Surg 2002;126(6):623–627. doi:10.1067/mhn.2002.125602.
11. Bhattacharyya N, Lee LN. Evaluating the diagnosis of chronic rhinosinusitis based on clinical guidelines and endoscopy. Otolaryngol Head Neck Surg 2010;143(1):147–151. doi:10.1016/j.otohns.2010.04.012.
12. Ferguson BJ, Narita M, Yu VL, et al. Prospective observational study of chronic rhinosinusitis: environmental triggers and antibiotic implications. Clin Infect Dis 2012;54(1):62–68. doi:10.1093/cid/cir747.
13. Vining EM, Yanagisawa K, Yanagisawa E. The importance of preoperative nasal endoscopy in patients with sinonasal disease. Laryngoscope 1993;103(5):512–519. doi:10.1288/00005537-199305000-00006.

Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study

Abdul Azeez Vallur

How to cite this article:
Abdul Azeez Vallur. Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study. RFP J ENT Allied Sci. 2019;4(2):53–56.

Author Affiliation: Associate Professor, Department of ENT, Dr. V.R.K. Womens Medical College, Aziz Nagar, Moinabad, Hyderabad, Telangana 500075, India.

Corresponding Author: Abdul Azeez Vallur, Associate Professor, Department of ENT, Dr. V.R.K. Womens Medical College, Aziz Nagar, Moinabad, Hyderabad, Telangana 500075, India.

E-mail: azeez_imam@yahoo.com

Received on 19.12.2019; **Accepted on** 30.12.2019

Abstract

Background: Adenoid, also termed as nasopharyngeal tonsil, Lushka's tonsil, is located at the junction of roof and posterior wall of the naso-pharynx. Infections like recurrent rhinitis, sinusitis, tonsillitis can cause chronic Adenoid infection and hypertrophy which can be diagnosed by a postnasal mirror examination, rigid nasal endoscopic examination. *Objectives:* To relate adenoid hypertrophy by performing x ray nasopharynx lateral view for soft tissues anddiagnostic rigid nasal Endoscopy. *Methodology:* It was a prospective study conducted among patients visiting tertiary care institute both pediatric and adult group both in patient and out -patient departments of ENT. Patients were selected as case material, with clinical features of Nasal obstruction, Nasal discharge, Sinusitis, Epistaxis, Voice change, Aural symptoms like Tubal obstruction etc were selected. A detailed clinical examination is done. SPSS 21 was used for analysis. Nonparametric test and correlation value were computed. *Results:* 50 patients were studied as the sample size, all of whom were subjected to both the modalities of investigation, after entering the results in a master charta statistical analysis was done. Value calculated showed a result of +0.795, which is approximating to +0.8, that is very much nearer to +1, showing very strong and positive relation between X-ray and Rigid endoscopic grade which means that x-ray nasopharynx lateral view for soft tissues is nearly as reliable as Rigid endoscopy and thus can beused as reliable tool in diagnosing Adenoid hypertrophy. *Conclusion:* Even in this endoscopic era, x –ray nasopharynx lateral view for soft tissue can be useful and as reliable as a diagnostic tool for the diagnosis of adenoid hypertrophy, which may the only available investigation in the absence of rigid nasal endoscopic equipment.

Keyword: Adenoid hypertrophy; Nasal endoscopy; Airway obstruction; Nasal discharge; Sinusitis; X-ray nasopharynx.

Introduction

Adenoid or Nasopharyngeal tonsil form the central part of the ring of lymphoid tissues surrounding the oro-pharyngeal is thmus, called Waldeyer's ring at the portal of upper respiratory tract. In early childhood it is the first site of contact for inhaled antigens. Historically adenoid has been associated with upper airway obstruction, as afocus of sepsis, more recently with the persistence of otitis media with effusion. Adenoid can be identified by MRI from the age of four months in 18% of the children.[1]

By 5 months of age, the adenoid tissue could be identified in almost all children. Growth continues during infancy and plateaus between 2 and 14 years of age. Regression of the adenoids occurs rapidly after 15 years of age in most children the adenoids appears to be at its largest size in 7 years old agegroup.[2] With the arrival of endoscopy, now a more commonly used as the diagnostic tool for adenoid hypertrophy there are many false negative and false positive reports when x ray is exclusively used as a diagnostic tool. The rationale behind the study was to establish a correlation about how far x ray is effective in diagnosing the adenoid hypertrophy, in comparison with RNE.

Materials and Methods

This was a prospective interventional study planned for a period of nearly 1 years from July 2018 to June 2019. Patients visiting tertiary care institute both paediatric and young adult group both in patient and out -patient in Department of ENT were selected as study subject with clinical features of Nasal obstruction, Nasal discharge, Sinusitis, Epistaxis, Voicechange, Aural symptoms like Tubal obstruction, Recurrent acute otitis media, Serous otitis media with fluctuating hearing loss, general features of Adenoid facies and Pulmonary hypertension are selected. Both pediatric and adult age group patients are selected, and detailed clinical examination done relevant investigations are carried out and correlation ismade between X ray Naso-pharynx lateral view for soft tissues and Diagnostic rigid nasal endoscopy. Patients with nasal polyps, Growths, deviated nasal septum. X rayneck lateral view for soft tissue to see Adenoid: Nasopharynx ratio: Graded as– 1,2,3,4. Patient's neckkept in minimum extension are excluded.

Materials and Methods

Endoscopyis done After application of local anesthesia by nasal packs with 4% lignocaine and adrenaline (1:80000), 30-degree 4 mm storz Rigid nasal endoscope is passed with patient in supine position. The space between the posterior end of septum and roof of nasopharynx anteroposterior and between the two eustachian tube orifices laterally is taken into consideration to see the extent of adenoids hypertrophy in two dimensions. The radiograph taken is x- ray nasopharynx lateral view for soft tissues. It is taken with patient in supine positionand neck slightly extended. Siemen'S Multix machine was used, and x ray field was collimated to the nasopharynx, with a focus film distance of 40 inches using average exposure factors of 60 kv and 3.2 milli-ampere-seconds. Fujioka method[3]- It is the method selected for estimating the nasopharyngeal air way obstruction by adenoid hypertrophy. Adenoid thickness is defined as the distance along a perpendicular line from the pharyngeal tubercle on thebase of skull to the adenoid convexity. This is the method followed for estimation of Adenoid hypertrophy on an X – ray lateral view of the nasopharynx for soft tissues. X –ray is taken in deep inspiration and the neck is kept in partially extended, with beam of X – ray being focused on the nasopharynx region. The distance between the outermost point of the convexity of Adenoid shadow and Spheno-basiocciput, [A], is divided to distance between spheno-basiocci put and posterior end of the Hard palate, [N]. When synchondrosis is not clearly visualized, the point where posteroinferior margin of lateral pterygoid plates crosses the floor of bony nasopharynx can be used.

Table 1: Adenoid Hypertrophy grading by FUJIOKA method

Grade	A/N Ratio
1	¼ to 1/3
2	1/3 to 2/3
3	2/3 to near complete occlusion
4	Complete occlusion

Fig. 1: X ray nasopharynx lateral view – Methodology of measurement of adenoid hypertrophy

Statistical Analysis

The above date is compared using a scientific approach, as to how much an x –ray Nasopharynx is reliable when compared to the other diagnostic modality. To relate how far X-ray Nasopharynx lateral view for soft tissues is on par with Diagnostic Rigid Nasal Endoscopy. Kandall - Tau's 13 correlation method after analysis gives a value which is in between -1 to +1, and if the result is nearer to +1, it suggests that a positive. SPSS -Version 21 Software was used for analysis.

Results

Table 2: Age and Sex wise distribution of study participants (*n* = 50)

Age (years)	Males (*n* = 30)	Females (*n* = 20)	*p*-value
0–5	3	2	0.11
5–10	6	3	
10–15	15	7	
15–20	6	8	

As per Table 3 the study was male preponderance comprising 60% of total study subjects. The most common age group was found to be 10–15 years (50%) in males and 15–20 years (45%) in males. The least common age group was 0–5 years. Which signifies that adenoid hypertrophy was not common in young age group, while in males and females it was in different in age group but not significant which means it is comparable.

Table 3: Presenting complaints in the study participants (*n* = 50)

Chief complaints	N (%)
Nasal blockage	22 (44)
Sore throat	10 (20)
Nasal discharge	5 (10)
Ear discharge	5 (10)
Snoring	3 (6)
Sneezing	3 (6)
Decreased hearing	2 (4)

As per Table 3 the most common chief complaint was found to be nasal blockage seen in 44% of cases, followed by 20% in sore throat. Nasal discharge and ear discharge were seen in 10% of cases. While the least common complaint was found to be decreased hearing.

Table 4: Rigid Nasal Endoscopy with respect to Adenoid Hypertrophy

Grade	N (%)
1	18 (36)
2	24 (48)
3	6 (12)
4	2 (4)

As per Table 4 grades are set according adenoid hypertrophy in terms of rigid nasal endoscopy. As seen, most of the patient are Grade 2 (48%) as per diagnostic basis followed by Grade 1 in 36% of patients. Grade 3 and 4 are least diagnostic.

Table 5: X ray with respect to Adenoid Hypertrophy

Grade	N (%)
1	22 (44)
2	22 (44)
3	3 (6)
4	3 (6)

As per Table 5 grades are set according adenoid hypertrophy in terms of x ray. As seen, most of the patient are Grade 2 and 1 equally (44%) as per diagnostic basis. Grade 3 and 4 are least diagnostic. This further concludes that x-ray can be a reliable diagnostic modality in the absence of rigid nasal endoscopy.

Table 6: Correlation between X-ray and Rigid Nasal Endoscopy in the view of soft tissue

Grade	*r* (Xray)	*r* (RNE)	*p*-value
1	0.795	0.80	0.001*
2	0.664	0.996	0.01*
3	0.210	0.761	0.01*
4	0.113	0.321	0.01*

As seen through Table 6 in the view of soft tissue and adenoid hypertrophy both X-ray and rigid nasal endoscopy showed positive correlation which was found to be highly significant ($p < 0.05$). This concludes that though nasal endoscopy is superior than X-ray, but it is equally effective diagnostic technique.

Discussion

P.J. Wormald demonstrated the efficacy of flexible naso-pharyngoscopy compared with lateral neck radiography and clinical symptoms in the assessment of adenoid hypertrophy in children's. Chandrasekhar et al. studies correlates with the study.[4] Babak Saedi, Mohammed Sagedhi, et al. study was designed for better understanding of the role of different methods of nasal endoscopy in the assessment of adenoid hypertrophy and comparing them with lateral neck radiography and patients' symptoms. The results of the study indicated that both radiography and nasal endoscopy could define the relationship between adenoid hypertrophy and associated symptoms and therefore are complementary.[5] Between them, despite the popularity of nasal endoscopy, radiography can serve as a better planning tool. S.B. V chandrasekhar et al. study got similar result Mary Kurienetal used X-Rays in the evaluation of adenoid hypertrophy. Lateral radiograph of the neck and aflexible nasopharyngeal endoscopy was done to evaluate adenoid enlargement in children aged 3–12 years who were included in a 5-week randomized double-blind placebo-controlled study for the effect of beclomethasonein adenoid hypertrophy.[6] These were graded independently by both the co-investigator and investigator X-ray and nasal endoscopy for re-evaluation of adenoid size was done at the completion of the study. Variables of both the procedures were scored at the beginning and end of the study. This study showed that lateral X-rays of the neck, besides being a non-invasive procedure, remains a very reliable and valid diagnostic test in the evaluation of hypertrophied adenoids. Navin kondapati et al. in their study, 13 cases of adenoid hypertrophy were seen between the age group of 18 to 39 years. Patients came with complaints of nasal obstruction, snoring and mouth breathing. Diagnostic nasal endoscopy showed enlarged soft tissue in the nasopharynx, probably hypertrophied adenoids. Computerised tomography was done to rule out other differential diagnosis.[7] After surgical excision the tissue was sent for histopathological examination that confirmed diagnosis. For complete removal trans nasal endoscopes were used in assistance. Patients were regularly followed up for any recurrence. At the end of the study they concluded that instead of regressing in a natural physiological way with age, adenoids can remain in the nasopharynx, sometimes getting enlarged due to infection. One should keep enlarged adenoids as differential diagnosis in adults while dealing with a nasopharyngeal lesion. Our study goes in favour of their findings. In a Comparison between radiological and Nasopharyngolaryngoscopic assessment of adenoid tissue volume in mouth breathing children. Gangadhara Somayaji K. S., et al. In a study of Significance of Adenoid Nasopharyngeal Ratio in the Assessment of Adenoid Hypertrophy in Children.[8] Radiological assessment of lateral radiograph of nasopharynx was done. On analysis of the results, x-raynasopharynx lateral view for soft tissues can be helpful asa diagnostic tool in patients having adenoid hypertrophy even in the endoscopic era and it can be used as an aid for preoperative investigation when endoscopic equipment is not available.

Conclusion

On analysis, the results, x-ray nasopharynx lateral view for soft tissues can be helpful as a diagnostic tool in patients having adenoid hypertrophy even in the endoscopic era, and it can be used as an aid for preoperative investigation when endoscopic equipment isnot available.

Source of Funding: None

Conflict of Interest: None declared

References

1. Jaw TS, Sheu RS, Liu GC, Lin we. Development of adenoids: A study by measurements of MRI images. kaoshing journal of medical sciences 1999;15(1):12–18.
2. Volger RC, Ii Fj, pilgrim TK. Age specific size of normal adenoid pad on MRI. Clinical otolaryngology and allied sciences 2000:25:392–5.
3. Fujioka M, young LW, Girdany BR. Radiological evaluation of the adenoid size in children: Adenoid nasopharynx ratio. AJR Am J Roentgenol 1979;133:401–4.
4. PJ Weormald and CAJ Prescott journal of otology and laryngology 1992;106:342–34.
5. Babak S, Mohammad S, Mohammad M, Hossein M. Diagnostic efficacy of different methods in the assessment of adenoid hypertrophy American Journal of otolaryngology 2011 Mar-Apr;32(2):147–51.
6. Mary K, Anjali L, John M, et al. X-Rays in the evaluation of adenoid hypertrophy: It's role in the endoscopic era, Indian J Otolaryngol Head Neck Surg. 2005 Jan; 57(1):45–47.
7. Kondapati N, Shinde V, Deogawkar S, Ghate G. Adenoid Hypertrophy in Adults - A Myth or Reality. Webmed Central otolaryngology 2013; 4(3):WMC004079.
8. Gangadhara Somayaji KS, Rajeshwari A, Mahaveera Jain. Significance of Adenoid. Nasopharyngeal Ratio in the Assessment of Adenoid Hypertrophy in Children. Research in Otolaryngology 2012;1(1):1–4.

Comparison of Facial Nerve Injury and Recovery Rates after Antegrade and Retrograde Nerve Dissection in Superficial Parotidectomy Surgery for Benign Parotid Disease

Hukam Singh

How to cite this article:
Hukam Singh. Comparison of Facial Nerve Injury and Recovery Rates after Antegrade and Retrograde Nerve Dissection in Superficial Parotidectomy Surgery for Benign Parotid Disease. RFP J ENT Allied Sci. 2019;4(2):57–63.

Author Affiliation: Professor and Head, Department of Otorhinolaryngology and Head and Neck Surgery, Rama Medical College, Hospital and Research Center, NH-8 Near Mother Dairy, Pilakhuwa, Uttar Pradesh 245304, India.

Corresponding Author: Hukam Singh, Professor and Head, Department of Otorhinolaryngology and Head and Neck Surgery, Rama Medical College, Hospital and Research Center, NH-8, Near Mother Dairy, Pilakhuwa 245304, Uttar Pradesh, India.

E-mail: dr.hukamrekha@ gmail.com

Received on 17.12.2019; **Accepted on** 30.12.2019

Abstract

Aim: This study was undertaken to compare the proximal and distal facial nerve exploration approach during superficial parotidectomy. *Materials and Methods:* A retrospective analysis of patients who underwent superficial parotidectomy at our tertiery referal center was conducted. Cases were divided into those who underwent superficial parotidectomy using distal facial nerve exploration and those who underwent standard proximal facial nerve exploration. Statistical comparisons of intraoperative blood loss and margin status (negative, focally, positive) were conducted between these two approaches. *Results:* A total of 42 patients underwent superficial parotidectomy at our Tertiary referal center between May 2015 and April 2019. The technique used in most of the cases was conventional proximal nerve exploration technique (30 cases). Distal exploration of the buccal branch was undertaken only in 12 cases, on account of difficulty in locating the main trunk intraoperatively due to the presence of postinflammatory fibrosis. The average patient age was 38 years with a female preponderance (64%). Distal nerve exploration technique consumed almost average operative time less than 2 hours (1.6 hrs) and average intraoperative blood loss 25 ml but in proximal nerve exploration technique have average operative time more than 2 hours (2.2 hrs) intra operative average blood loss 70 ml was recorded. No significant difference in surgical margin status was noticed between the two techniques ($p > 0.05$). *Conclusion:* Both the techniques are efficient without compromising the surgical margins, but the average intraoperative blood loss and surgical operative time are less in distal facial nerve exploration technique.

Keywords: Distal; Facial nerve; Proximal; Superficial parotidectomy

Introduction

The facial nerve can be dissected using an antegrade or retrograde approach. Antegrade dissection is the established technique and retrograde dissection is used less often. Recent publications have drawn attention to the potential value of the retrograde technique particularly if direct identification of the nerve trunk is difficult, and in revision procedures.Parotid gland surgery is technique sensitive because of the close relationship of the gland with the extracranial facial nerve which is the motor supply to the muscles of facial expression. If the facial nerve is not involved preoperatively, its preservation is important for both aesthetic and functional outcome of the surgery. The most frequent morphology of the facial nerve is reported, in the literature[1–3] to be dichotomous, with cervicofacial and temporofacial divisions further dividing into temporal, zygomatic, buccal, marginal mandibular, and cervical branches. The superior temporofacial branch runs upward and medially and is generally larger. The anatomical evaluations reveal that all the five branches run in the substance of parotid isthmus, dividing the gland into superficial and deep lobes. They are covered by glandular acini and rests on the aponeurosis of the masseter muscle, with its temporal and zygomatic component running to a thin adipose layer upon its emergence from the cranial pole of the gland. Facial nerve is identified by means of proximal surgical technique aimed at isolating proximally the main nerve trunk anywhere between stylomastoid foramen and parotid gland entry. Distal nerve identification techniques are rarely described in the literature, these being adapted, as necessary, by the surgeon, depending on the localization of the neoplasm, and approach the isolation of the nerve beginning from any of its peripheral branches. Rarely, after recurrent infection and fibrosis or previous radiotherapy, the trunk of facial nerve is difficult to be identified using conventional technique.[4] In this situation, nerve is identified at the anterior border of the parotid and traced centrally toward the stylomastoid foramen. This study was undertaken to compare the proximal and distal facial nerve exploration approach during superficial parotidectomy.

It was advocated by Janes[19] and Bailey[20] to identify the main trunk of the facial nerve first, followed by removal of the superficial and/or deep lobe of the parotid gland. Using this technique, the reported recurrence rate and permanent facial nerve paralysis rate become very rare, decreasing to (0.2%) and (2.2%) respectively.[21]

Materials and Methods

This is a retrospective analysis of patients who underwent superficial parotidectomy at our tertiary referal center was conducted. Cases were divided into those who underwent superficial parotidectomy using distal facial nerve exploration (n = 12) and those who underwent standard proximal facial nerve exploration (n = 30). Exclusion criteria included planned total parotidectomy for known high-grade malignancy, parotid biopsy of salivary tissue for diagnostic purposes (i.e., rule out Sjogren's syndrome), and revision parotidectomy. The study population comprised 27 females and 15 males, from 19 to 56 years of age. In none of the cases, a loupe/operative microscope was used or electrophysiological monitoring of facial nerve was undertaken. The average patient age was 38 years with a female preponderance (64%). Distal nerve exploration technique consumed almost average operative time less than 2 hours (1.6 hrs) and average intraoperative blood loss 25 ml but in proximal nerve exploration technique have average operative time more than 2 hours (2.2 hrs) intera operative average blood loss 70 ml was recorded. Statistical comparisons of average intraoperative blood loss and margin status (negative, focally, positive) were conducted between these two approaches. Postoperative complications, such as facial nerve weakness, and wound complications, such as sialocele formation, hematoma, and wound infection, were also recorded. Statistical comparisons were conducted for the significance with the standard error of difference between two means and Pearson's Chi-square, where appropriate, with significance set at $p < 0.05$.

Surgical Technique

Whenever the medical condition allowed and the patient was fit, hypotensive anesthesia was used, as this considerably reduced oozing and thus made it easier to trace the facial nerve fibres. The modified Blair's incision line (Fig. 2) was marked and infiltrated with lignocaine hydrochloride with 1:80,000 adrenaline. The incision was made with a Colorado microdissection needle. The skin flap was raised in the plane of the preparotid fascia. Blood-free plane, anterior to the external auditory meatus which leads the surgeon down to the base of skull, just superficial to the styloid process and the stylomastoid foramen, was then gently opened up in an inferior direction by blunt dissection until the trunk of the facial nerve is seen, but was generally misleading and hence was not our choice of entry in the region. We identified the posterior belly of the digastric muscle in the cervical extension of the incision. The anterior border of the sternocleidomastoid muscle was mobilized and retracted inferiorly to display the posterior belly of digastric muscle beneath it. This maneuver necessitated the sectioning of great auricular nerve. The posterior belly of the digastric was traced upward and backward to its insertion onto the mastoid which lay immediately below the stylomastoid foramen, thus leading the operator to the facial nerve from below. Once the facial nerve trunk was identified, the superficial lobe of the parotid was "exteriorized" by opening along a plane in which the branches of the facial nerve run between the two lobes, by blunt dissection. Usually, as it leaves the stylomastoid foramen, the trunk of the facial nerve turns abruptly to become more superficial (Fig. 3) and also divides into the larger zygomaticofacial trunk and smaller cervicofacial trunk (Fig. 4). The five main branches of the nerve (Fig. 5) were then followed peripherally through the parotid until the superficial lobe was completely freed. This part of the operation was performed using fine scissors, opened up in the plane of the facial

(A.) (B.) (C.)

Fig. 1: Pre operative view showing different size of parotid tumour

Fig. 2: Marking of modified Blair's incision

Fig. 3: Exploration of proximal facial nerve main trunk

Fig. 4: Dissection of upper and lower division of facial nerve

nerve branches, with care always taken to identify the nerve fiber before dividing parotid tissue. During dissection of the lower part, branches of the posterior facial vein were encountered immediately deep to the marginal mandibular branch. Great care was taken when vascular clamps are applied to these branches to avoid damaging the facial nerve. If the superficial parotidectomy was being performed for chronic infection, the duct was tied off as far forward as possible to prevent recurrent ascending infection from the oral cavity. Rarely, after recurrent infection and fibrosis or previous radiotherapy, the identification of the trunk of facial nerve was difficult using conventional technique. In this situation, nerve was identified at the anterior border of the parotid and traced centrally towards the stylomastoid foramen. In the distal nerve exploration method, we first identified the buccal branch of the facial nerve (Fig. 6) about 4 cm anterior to the tragus along the alatragal line. This branch was dissected in a retrograde fashion as far as the main trunk of the facial nerve. The decision to resort to the identification of the buccal nerve was supported by the regular course and adequate size of this branch of facial nerve in its peripheral area colocated with Stenson's duct, which enables it to be easily identified during surgery. The remaining branches of the facial nerve were dissected in an anterograde fashion, displacing the parotid gland superiorly and inferiorly. Following removal of the parotid gland, the blood pressure was returned to normal, all bleeding points were controlled, a vacuum drain placed, and the wound closed in layers. There is minimal post-operative scar in all patients (Fig. 7).

All patients had peroperative nerve monitoring and were followed up at 1 week, 1 month, 3 months, or to full recovery of the nerve. The House-Brackmann (HB) grading system was used to assess the degree of injury to the nerve. A high rate of serious nerve injury (HBIII or above) was associated with retrograde dissection at 1 week. Serious nerve injuries (HBIII or above) were slow to recover after the antegrade technique at 3 months. There was no difference between groups in the rates of full nerve recovery at 6 months. The exclusion criteria included our studies that reported one of the following: 1) Malignant Tumors, 2) Pediatric patients 3) Revision Parotid surgery. 4) Sjogren's syndrome.

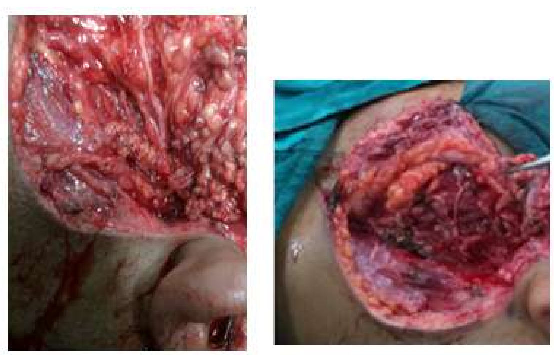

Fig. 5: Branching of facial nerve exposed following superficial parotidectomy

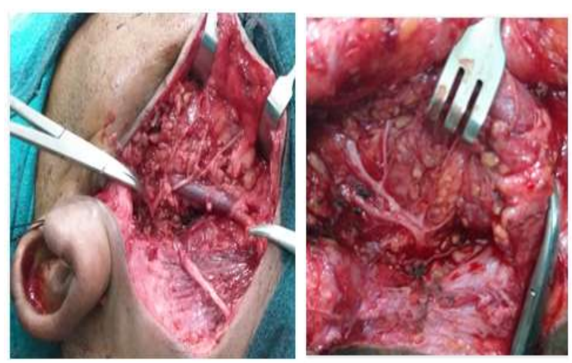

Fig. 6: Distal facial nerve exposure (buccal branch)

Fig. 7: Post Operative Wound

Statistics

Standard error of difference between two means of intraoperative blood loss

Average intraoperative blood loss in distal nerve identification technique = 25.00 cc

Standard deviation = 1.44

Average intraoperative blood loss in proximal nerve identification technique = 70 cc

Standard deviation = 4.14

Standard error of difference between two means

$= \sqrt{(4.14)^2/29 + (1.44)^2/10}$

$= \sqrt{0.598 + 0.207}$

$= \sqrt{0.805}$

$= 0.89$

The actual difference between the two means = 70-25 = 45

Chi-square test for testing significance of difference of surgical margins status

Surgical Margins Status	Proximal Nerve Identification	Distal Nerve Identification
Negative Margins	25	09
Close Margins	05	03
Positive Margins	00	00

Surgical margin in proximal nerve identification technique

Observed negative margins = 25

Expected = 21.56

Observed close margins = 05

Expected = 5.94

Observed positive margins = no

Expected = 0.48

Applying the Chi-square test,

$x^2 = \sum(O-E)^2/E$

$= 1.44^2/21.56 + 0.94^2/5.94 + 0.48^2/1.48 + 1.43^2/7.43 + 0.95^2/2.05 + 0.74^2/0.26$

$= 0.096 + 0.149 + 0.156 + 0.275 + 0.440 + 2.106$

$= 3.222$

Degrees of freedom = (column-1) (row-1)

$= (3-1)(2-1) = 2$

Using published probability tables, for degree of freedom 2, the value of Chi-square for a probability of 0.05 is 5.99. Therefore, at the value of Chi-square 3.222, $p > 0.05$.

Results

A total of 42 patients underwent superficial parotidectomy at our tertiary referral center between May 2015 and April 2019. The technique used in most of the cases was conventional proximal nerve exploration technique (30 cases). Distal exploration of the buccal branch was undertaken only in 12 cases, on account of difficulty in locating the main trunk intraoperatively due to the presence of postinflammatory fibrosis. The average patient age was 38 years with a female preponderance (64%). Distal nerve exploration technique consumed almost average operative time less than 2 hours (1.6 hrs) and average intraoperative blood loss 40 ml but in proximal nerve exploration technique have average operative time more than 2 hours (2.2 hrs) intera operative average blood loss 70 ml was recorded. The actual difference between the two means is 42.6, which is more than twice the standard error of difference between the two means, and therefore "significant." This signifies that the average intraoperative blood loss is less in distal facial nerve exploration technique. Among the standard parotidectomy using proximal facial nerve identification group, there were 25 negative margins, 05 focally close margins, and 0 no positive margin, whereas among the distal facial nerve identification group, there were 09 negative margins, 03 focally close margins, and no positive margins. No significant difference in surgical margin status was noticed between the two techniques ($p > 0.05$).

Table 1: Distribution of patients demographic

		Proximal Nerve Exploration	Distal Nerve Exploration	Total Patients
Age(Avg.)		38	38	
Sex	Male	10	05	15
	Female	20	07	27

Though there was no motor deficit in the case where distal nerve exploration was done, functional outcome of the surgery cannot be compared. Temporary facial nerve dysfunction of 01 (Marginal Mandibular) branch was found only in one case (Table 2).

Table 2: Complication of superficial parotidectomy

Complication of superficial parotidectomy	Total patients
Permanent facial nerve dysfunction	00
Temporary facial nerve dysfunction	01
Wound Infection	00
Hematoma	00
Sialocele	00
Others	00

Table 3: Histopathological tumours type

Benign Tumours of Parotid	Total patients
Pleomorphic Adenoma	33
Warthin tumour	06
Parotid cyst	02
Parotid fistula	01

The most common tumours are pleomorphic adenoma was operated in our study.

Discussion

Whatever the type of parotidectomy surgical technique performed, dissection and preservation of the facial nerve can only be achieved using two approaches; antegrade or retrograde. To the best of our knowledge, this is the our retrospective study compared the AFND and RFND approaches used in parotidectomy regarding the incidence of facial nerve paralysis and other complications in benign parotid surgery. The classic approach to facial nerve requires four anatomical landmarks leading to the identification of the trunk of the facial nerve,[4] as it leaves the stylomastoid foramen which are as follows: (a) The cartilaginous external auditory meatus forms a "pointer" at its anterior inferior border indicating the direction of the nerve trunk; (b) Just deep to the cartilaginous pointer is a reliable bony landmark formed by the curve of the bony external meatus and its abutment with the mastoid process. This forms a palpable groove leading directly to the stylomastoid foramen. Unfortunately, this groove is filled with fibrofatty lobules that often mimic the trunk of the facial nerve which can lie as much as 1 cm deep to this landmark; (c) The anterior, superior aspect of the posterior belly of the digastric muscle is inserted just behind the stylomastoid foramen; (d) The styloid process itself can be palpated superficial to the stylomastoid foramen and just superior to it. The nerve is always lateral to this plane and passes obliquely across the styloid process. A branch of the postauricular artery is usually encountered just lateral to the nerve. This technique is most frequently used and generally held to be the safest for anatomical and functional nerve preservation. Satisfactory results are obtained after partial or total conservative parotidectomy procedures with proximal nerve identification technique, in which the percentage of permanent nerve paralysis is less than 1 to 2% in cases of benign pathologies,[5–8] while the rate of temporary deficits ranges from 20 to 55%.[9–11] In very few cases, the proximal approach to facial nerve is extremely difficult, even with the use of an operative microscope and with intraoperative monitoring of the facial nerve, and it is, therefore, necessary to use the distal nerve localization technique. The technique of identifying the facial nerve by means of the isolation of its peripheral branches has been codified for years: in the 80s, even Work and Bailey presented several examples of the retrograde approach from the buccal, mandibular, and temporal rami in those cases in which they reach the surface of the parotid gland. These authors recommend following the deep parotid vein as reference for the mandibular rami, which crosses it laterally.[4] In our opinion, both proximal and distal nerve exploration can be used to identify the facial nerve without compromising the outcome of the surgery, though at our center, distal nerve exploration is only used when proximal nerve isolation is found to be extremely difficult intraoperatively. In our case, after the preparation of the skin flap, dissection in the parotid region was found difficult due to fibrosis, because of recurrent parotid and periparotid inflammation preoperatively. In our opinion, identification of the buccal nerve is supported by the regular course and adequate size of this facial branch in its peripheral area co-located with Stenson's duct which enables it to be easily identified. Intraoperative monitoring of facial nerve function, using electromyographic techniques, is proposed in parotid surgery to identify the principal nerve trunk and its peripheral branches in complex cases or during retrograde approaches.[12–14] Following parotidectomy using facial nerve monitoring, Terrell et al.[15] achieved a low percentage of early postoperative facial nerve paralysis in the group monitored, albeit there was no significant statistical difference in long-term nerve function; Witt,[11] on the other hand, demonstrated a high rate of facial paralysis in a group monitored during superficial parotidectomy, concluding that electrophysiological monitoring is optional and must not be considered a standard technique in such surgery. The validity of facial nerve monitoring can play an important and advantageous part in the surgical treatment of recurrent parotid neoplasms.[12,15] Facial nerve monitoring along with distal nerve exposure is well supported in literature and found to be efficacious in cases of partial parotidectomy. The distal facial nerve identification technique causes less intraoperative bleed.[16] The main point of reference in the isolation of the facial nerve is the posterior belly of the digastric muscle; when, however, if proximal nerve exploration is difficult, isolation of the nerve through the distal nerve exploration from the buccal branch can be carried out.[17,18]

Conclusion

Both proximal and distal facial nerve exploration techniques for superficial parotidectomy are efficient without compromising the surgical margins status. From the results we have achieved, we can conclude that the both the techniques are equally effective for preventive facial nerve paralysis but the average intraoperative blood loss and surgical operative time are less in distal facial nerve exploration technique.

References

1. Davis RA, Anson BJ, Bundiger JM, Kurth LE. Surgical anatomy of the facial nerve based upon a study of 350 cervicofacial halves. Surg Gynecol Obstet 1956;102(4):385–412.
2. Katz AD, Catalano P. The clinical significance of the various anastomotic branches of the facial nerve. Report of 100 patients. Arch Otolaryngol Head Neck Surg 1987;113:959–62.
3. McCormak LJ, Cauldwell EW, Anson BJ. The surgical anatomy of the facial nerve. Surg Gynecol Obstet 1945;80:620–30.
4. Work WP, Bailey DG. Surgery of the major salivary glands. In: Paparella MM, Shumrick DA, editors. Otolaryngology. Vol 3. Philadelphia: WB Saunders Company 1980.
5. Dimitrov SA. Our experience with surgical dissection of the facial nerve in parotid gland tumours (a preliminary report). Folia Med (Plovdiv) 2000;42(1):37–40.
6. Leverstein H, van der Wal JE, Tiwar RM, van der Wal I, Snow GB. Results of the surgical management and histopathological evaluation of 88 parotid gland Warthin’s tumours. Clin Otolaryngol 1997;22:500–3.
7. Moody AB, Avery CM, Walsh S, Sneddon K, Langdon JD. Surgical management of chronic parotid disease. Br J Oral Maxillofac Surg 2000;38:620–2.
8. Webb AJ, Evenson JW. Plemorphic adenomas of the major salivary glands: A study of the capsular form in relation to surgical management. Clin Otolaryngol 2001;26:134–42.
9. Rea JL. Partial parotidectomies: Morbidity and benign tumor recurrence rates in a series of 94 cases. Laryngoscope 2000;110(6):924–7.
10. Sungur N, Akan IM, Ulusoy MG, Ozdemir R, Kilinc H, Ortak T. Clinicopathological evaluation of parotid gland tumors: A retrospective study. J Craniofac Surg 2002;13(1):26–30.
11. Witt RL. Facial nerve function after partial superficial parotidectomy: An 11 years review 1987-97. Otolaryngol Head Neck Surg 1999;121:210–3.
12. Lin SD, Tsai CC, Lai CS, Lee SS, Chang KP. Endoscopyassisted parotidectomy for benign parotid tumors. Ann Plast Surg 2000;45:269–73.
13. Brennan J, Moore EJ, Shuler KJ. Prospective analysis of the efficacy of continuous intraoperative nerve monitoring during thyroidectomy, parathyroidectomy and parotidectomy. Otolaryngol Head Neck Surg 2001 May;124(5):537–43.
14. Isaacson G, Martin WH. First branchial cleft excision with electrophysiological facial nerve localization. Arch Otolaryngol Head Neck Surg. 2000 Apr;126(4):513–6.
15. Terrell JE, Kileny PR, Yan C. Clinical outcome of continuous facial nerve monitoring during primary parotidectomy. Arch Otolaryngol Head Neck Surg 1997;157:1081–7.
16. Bhattacharyya N, Richardson ME, Gugino LD. An objective assessment of the advantages of retrograde parotidectomy. Otolaryngol Head Neck Surg 2004 Oct;131(4):392–6.
17. O’Regan B, Bharadwaj G, Elders A. Techniques for dissection of the facial nerve in benign parotid surgery: A cross specialty survey of oral and maxillofacial and ear nose and throat surgeons in the UK. Br J Oral Maxillofac Surg. 2008 Oct;46(7):564–6.
18. O’Regan B, Bharadwaj G, Bhopal S, Cook V. Facial nerve morbidity after retrograde nerve dissection in parotid surgery for benign disease: A 10-year prospective observational study of 136 cases. Br J Oral Maxillofac Surg 2007;45:101–7.
19. Janes RM. The treatment of tumours of the salivary glands by radical excision. Can Med Assoc J. 1940 Dec;43(6):554–559. [PMC free article] [PubMed] [Google Scholar].
20. Bailey H. The treatment of tumours of the parotid gland with special reference to total parotidectomy. Br J Surg 1941;28(11):337–46. [Google Scholar].
21. Foresta E, Torroni A, Di Nardo F, De Waure C, Poscia A, Gasparini G, et al. Pleomorphic adenoma and benign parotid tumors: extracapsular dissection vs superficial parotidectomy—review of literature and meta-analysis. Oral Surg Oral Med Oral Pathol Oral Radiol 2014;117:663–76. 10.1016/j.oooo.2014.02.026 [PubMed] [CrossRef] [Google Scholar].
22. Sharma R, Menon P S, Sinha R. An objective assessment of proximal and distal facial nerve exploration during superficial parotidectomy. Ann Maxillofac Surg. 2011 Jan;1(1):3–7.

Subject Index

Tittle	Page No
Comparison of Facial Nerve Injury and Recovery Rates after Antegrade and Retrograde Nerve Dissection in Superficial Parotidectomy Surgery for Benign Parotid Disease	57
Current Treatment Option of Osteoma in the Mastoid of the Temporal Bone	9
Effectiveness of Diagnostic Nasal Endoscopy and Computed Tomography in the Diagnosis of Chronic Rhinosinusitis	47
Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study	53
Mobile Phone and Auditory Effects? Time to Think	17
Prospective Study of Myringoplasty in Children	41
Unusual Anteriorly Placed Sigmoid Sinus: A Rare Case Report from Uttarakhand (India)	23

Author Index

Name	Page No	Name	Page No
Abdul Azeez Vallur	53	Nitin R Ankale	47
Abhishek Bharadwaj	23	Prateek Varshney	17
Amit Kumar	23	RN Patil	47
Amit Tyagi	23	Rajesh Radhakrishna Havaldar	47
Babita Ramdev	41	Sangeeta Aggarwal	41
Dinesh Kumar Sharma	41	Sangeeta Singh	9
Hukam Singh	57	Saurabh Varshney	17
Hukam Singh	9	Saurabh Varshney	23
Madhupriya	23	Shalu Jindal	41
Manu Malhotra	23	Shubhankur Gupta	23

Guidelines for Authors

Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journal" developed by international committee of medical Journal Editors

Types of Manuscripts and Limits

Original articles: Up to 3000 words excluding references and abstract and up to 10 references.

Review articles: Up to 2500 words excluding references and abstract and up to 10 references.

Case reports: Up to 1000 words excluding references and abstract and up to 10 references.

Online Submission of the Manuscripts

Articles can also be submitted online from http://rfppl.co.in/customer_index.php.

I) First Page File: Prepare the title page, covering letter, acknowledgement, etc. using a word processor program. All information which can reveal your identity should be here. use text/rtf/doc/PDF files. Do not zip the files.

2) Article file: The main text of the article, beginning from Abstract till References (including tables) should be in this file. Do not include any information (such as acknowledgement, your name in page headers, etc.) in this file. Use text/rtf/doc/PDF files. Do not zip the files. Limit the file size to 400 Kb. Do not incorporate images in the file. If file size is large, graphs can be submitted as images separately without incorporating them in the article file to reduce the size of the file.

3) Images: Submit good quality color images. Each image should be less than 100 Kb in size. Size of the image can be reduced by decreasing the actual height and width of the images (keep up to 400 pixels or 3 inches). All image formats (jpeg, tiff, gif, bmp, png, eps etc.) are acceptable; jpeg is most suitable.

Legends: Legends for the figures/images should be included at the end of the article file.

If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks from submission. Hard copies of the images (3 sets), for articles submitted online, should be sent to the journal office at the time of submission of a revised manuscript. Editorial office: Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091, India, Phone: 91-11-22754205, 45796900, 22756995. E-mail: author@rfppl.co.in. Submission page: http://rfppl.co.in/article_submission_system.php?mid=5.

Preparation of the Manuscript

The text of observational and experimental articles should be divided into sections with the headings: Introduction, Methods, Results, Discussion, References, Tables, Figures, Figure legends, and Acknowledgment. Do not make subheadings in these sections.

Title Page

The title page should carry

1) Type of manuscript (e.g. Original article, Review article, Case Report)

2) The title of the article, should be concise and informative;

3) Running title or short title not more than 50 characters;

4) The name by which each contributor is known (Last name, First name and initials of middle name), with his or her highest academic degree(s) and institutional affiliation;

5) The name of the department(s) and institution(s) to which the work should be attributed;

6) The name, address, phone numbers, facsimile numbers and e-mail address of the contributor responsible for correspondence about the manuscript; should be mentoined.

7) The total number of pages, total number of photographs and word counts separately for abstract and for the text (excluding the references and abstract);

8) Source(s) of support in the form of grants, equipment, drugs, or all of these;

9) Acknowledgement, if any; and

l0) If the manuscript was presented as part at a meeting, the organization, place, and exact date on which it was read.

Abstract Page

The second page should carry the full title of the manuscript and an abstract (of no more than 150 words for case reports, brief reports and 250 words for original articles). The abstract should be structured and state the Context (Background), Aims, Settings and Design, Methods and Materials, Statistical analysis used, Results and Conclusions. Below the abstract should provide 3 to 10 keywords.

Introduction

State the background of the study and purpose of the study and summarize the rationale for the study or observation.

Methods

The methods section should include only information that was available at the time the plan or protocol for the study was written such as study approach, design, type of sample, sample size, sampling technique, setting of the study, description of data collection tools and methods; all information obtained during the conduct of the study belongs in the Results section.

Reports of randomized clinical trials should be based on the CONSORT Statement (http:// www. consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma. net/e/policy/l 7-c_e.html).

Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

Discussion

Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

References

List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_ requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, *et al*. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347-55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

More information about other reference types is available at www.nlm.nih.gov/bsd/uniform_requirements.html, but observes some minor deviations (no full stop after journal title, no issue or date after volume, etc).

Tables

Tables should be self-explanatory and should not duplicate textual material.

Tables with more than 10 columns and 25 rows are not acceptable.

Table numbers should be in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Explain in footnotes all non-standard abbreviations that are used in each table.

For footnotes use the following symbols, in this sequence: *, ¶, †, ‡‡,

Illustrations (Figures)

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files of minimum 1200x1600 pixel size. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the figure instead of to the side.

Original color figures can be printed in color at the editor's and publisher's discretion provided the author agrees to pay.

Type or print out legends (maximum 40 words, excluding the credit line) for illustrations using double spacing, with Arabic numerals corresponding to the illustrations.

Sending a revised manuscript

While submitting a revised manuscript, contributors are requested to include, along with single copy of the final revised manuscript, a photocopy of the revised manuscript with the changes underlined in red and copy of the comments with the point to point clarification to each comment. The manuscript number should be written on each of these documents. If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks of submission. Hard copies of images should be sent to the office of the journal. There is no need to send printed manuscript for articles submitted online.

Reprints

Journal provides no free printed reprints, however a author copy is sent to the main author and additional copies are available on payment (ask to the journal office).

Copyrights

The whole of the literary matter in the journal is copyright and cannot be reproduced without the written permission.

Declaration

A declaration should be submitted stating that the manuscript represents valid work and that neither this manuscript nor one with substantially similar content under the present authorship has been published or is being considered for publication elsewhere and the authorship of this article will not be contested by any one whose name (s) is/are not listed here, and that the order of authorship as placed in the manuscript is final and accepted by the co-authors. Declarations should be signed by all the authors in the order in which they are mentioned in the original manuscript. Matters appearing in the Journal are covered by copyright but no objection will be made to their reproduction provided permission is obtained from the Editor prior to publication and due acknowledgment of the source is made.

Approval of Ethics Committee

We need the Ethics committee approval letter from an Institutional ethical committee (IEC) or an institutional review board (IRB) to publish your Research article or author should submit a statement that the study does not require ethics approval along with evidence. The evidence could either be consent from patients is available and there are no ethics issues in the paper or a letter from an IRB stating that the study in question does not require ethics approval.

Abbreviations

Standard abbreviations should be used and be spelt out when first used in the text. Abbreviations should not be used in the title or abstract.

Checklist

- Manuscript Title
- Covering letter: Signed by all contributors
- Previous publication/ presentations mentioned, Source of funding mentioned
- Conflicts of interest disclosed

Authors

- Middle name initials provided.
- Author for correspondence, with e-mail address provided.
- Number of contributors restricted as per the instructions.
- Identity not revealed in paper except title page (e.g.name of the institute in Methods, citing previous study as 'our study')

Presentation and Format

- Double spacing
- Margins 2.5 cm from all four sides
- Title page contains all the desired information. Running title provided (not more than 50 characters)
- Abstract page contains the full title of the manuscript
- Abstract provided: Structured abstract provided for an original article.
- Key words provided (three or more)
- Introduction of 75-100 words
- Headings in title case (not ALL CAPITALS). References cited in square brackets
- References according to the journal's instructions

Language and grammar

- Uniformly American English
- Abbreviations spelt out in full for the first time. Numerals from 1 to l0 spelt out
- Numerals at the beginning of the sentence spelt out

Tables and figures

- No repetition of data in tables and graphs and in text.
- Actual numbers from which graphs drawn, provided.
- Figures necessary and of good quality (color)
- Table and figure numbers in Arabic letters (not Roman).
- Labels pasted on back of the photographs (no names written)
- Figure legends provided (not more than 40 words)
- Patients' privacy maintained, (if not permission taken)
- Credit note for borrowed figures/tables provided
- Manuscript provided on a CDROM (with double spacing)

Submitting the Manuscript

- Is the journal editor's contact information current?
- Is the cover letter included with the manuscript? Does the letter:

1. Include the author's postal address, e-mail address, telephone number, and fax number for future correspondence?
2. State that the manuscript is original, not previously published, and not under concurrent consideration elsewhere?
3. Inform the journal editor of the existence of any similar published manuscripts written by the author?
4. Mention any supplemental material you are submitting for the online version of your article. Contributors' Form (to be modified as applicable and one signed copy attached with the manuscript)

Instructions to Authors

Submission to the journal must comply with the Guidelines for Authors.
Non-compliant submission will be returned to the author for correction.

To access the online submission system and for the most
up-to-date version of the Guide for Authors please visit:

http://www.rfppl.co.in

Technical problems or general questions on publishing with JEAS are supported by Red Flower Publication Pvt. Ltd.'s Author Support team (http://rfppl.co.in/article_submission_system.php?mid=5#)

Alternatively, please contact the Journal's Editorial Office for further assistance.

Editorial Manager
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II
Mayur Vihar Phase-I
Delhi - 110 091(India)
Mobile: 9821671871, Phone: 91-11-22754205, 45796900, 22756995
E-mail: author@rfppl.co.in