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# Journal of Plastic Surgery and Transplantation

January–June 2020  
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## Contents

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### *Original Articles*

- The Role of APRP in the Management of Post Skin Graft Site** 09

Nishad K MS, Ravi Kumar Chittoria, Saurabh Gupta, Chirra Likhitha Reddy,  
Padmalakshmi Bharathi Mohan, Imran Pathan, Shijina K, Neljo Thomas

- Role of Mobile Telemedicine Kiosk for Tele-ICU Consultations  
During COVID-19 Period.** 11

Nishad K MS, Ravi Kumar Chittoria, Saurabh Gupta, Chirra Likhitha Reddy,  
Padmalakshmi Bharathi Mohan, Imran Pathan, Shijina K, Neljo Thomas

- Scalp and Calvarial Injury from Tiger Attacks: An Untouched Realm** 15

Rohan Digarse, Somil Jaiswal, Manish Jaiswal, Chhitij Srivastava, Anil Chandra, BK Ojha

- Role of Low Level Laser Therapy (LLLT) Inamputation Stump** 19

Neljo Thomas, Ravi Kumar Chittoria, Saurabh Gupta, Chirra Likhitha Reddy,  
Padmalakshmi Bharathi Mohan, Shijina K, Imran Pathan, Nishad K, Daisy Loyola

### *Case Report*

- Goldenhar Syndrome with Radial Club Hand: An Unusual Presentation** 23

Vinayak Chavan, Vijaymahantesh Pujari

- Guidelines for Authors** 26



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## The Role of APRP in the Management of Post Skin Graft site

Nishad K MS<sup>1</sup>, Ravi Kumar Chittoria<sup>2</sup>, Saurabh Gupta<sup>3</sup>, Chirra Likhitha Reddy<sup>4</sup>,  
Padmalakshmi Bharathi Mohan<sup>5</sup>, Imran Pathan<sup>6</sup>, Shijina K<sup>7</sup>, Neljo Thomas<sup>8</sup>

**Author Affiliation:** <sup>1,3,4,5,6,7,8</sup>Senior Resident, <sup>2</sup>Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**Corresponding Author:** Ravi Kumar Chittoria, Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**E-mail:** drchittoria@yahoo.com

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### Abstract

The split thickness skin graft is a time-tested method for covering a raw area. The autologous platelet rich plasma, rich in growth factor was used to for the management of a skin grafted site and to prevent the graft site complications like graft contracture, hypertrophy and grafted site ulceration.

**Keywords:** Autologous platelet rich plasma; Split Thickness Skin grafting; Wound bed preparation; Regenerative Therapy.

### Introduction

The split thickness skin graft is a time-tested method of management of raw areas. The split thickness graft site can develop complications like hypertrophy, graft contracture, graft site ulceration. The autologous platelet rich plasma is rich in growth factors which is useful in the rejuvenation of the graft site.

### Materials and Methods

The study was conducted in department of plastic surgery at a tertiary care center. This study was conducted after getting informed consent and getting ethical committee clearance. The study detail is as follows.

A 50 years old female patient with no known co-morbidities was admitted with infected venous ulcer over the left leg. The wound was prepared with wound irrigated with normal saline, thorough debridement of the wound and NPWT-id for wound bed preparation. The patient was treated with parenteral antibiotics based on exudate culture and sensitivity reports and when the wound got healthy granulation tissue, she underwent Split thickness. The grafted site was opened on the 5th post operation day and the graft was inspected.

The graft site was given local infiltration of APRP on post-operative day 5, post-operative day 7, day 14 and post-operative day 21.

Technique of APRP preparation followed was the standard technique as described by Franco *et al.*<sup>1</sup> and Li *et al.*<sup>2</sup> The steps of APRP preparation is as follows:

**Step 1:** A 10mL of the patient's venous blood was taken and heparinized

**Step 2:** Centrifugation at 3000 RPM continued for 10 minutes. Three layers will form in the tube at the end of 10 minutes

**Step 3:** The upper layer of the three layers was aspirated using sterile needle and syringe

**Step 4:** Re-centrifugation at 4000 RPM for 10 minutes. At the end of 10 minutes, the content will get separated into two layers.

The bottom layer is the plasma rich in platelets and was aspirated using sterile needle and syringe. The APRP is infiltrated under all aseptic precautions to the grafted site. The grafted site was given compression dressing in the form of elastocrepe bandage and the limb was kept elevated at the foot end with pillow for three weeks. The graft site was evaluated with Vancouver scar scale score at the beginning of each session.

## Result

The graft was taken up fully and there was improvement in the VSS score



Fig. 1: Three layers of APRP



Fig. 2: APRP at graft site

## Discussion

The Venous ulcer usually requires months to heal and well known for recurrence. The negative pressure wound therapy is a method known to

decrease the downtime of wound bed preparation, which was described in 1997.<sup>3-5</sup>

APRP is defined as a portion of the plasma fraction of autologous blood with a platelet concentration above the baseline<sup>6</sup> APRP as contains a high concentration of alpha granules, is a cost-effective and safe method of obtaining high concentrations of these growth factors. The alpha granules of platelets are known to contain growth factors such as PDGF, vascular endothelial growth factor, TGF, EGF, which promote angiogenesis, cell proliferation, maturation, and matrix formation.<sup>7</sup> As APRP is rich in growth factors, the use of APRP has been researched in the field of regenerative medicine in conditions such as alopecia, chronic wounds, and scar management.

## Conclusion

The APRP has certainly role in rejuvenation of the graft site and preventing complications, but as this study is done on a single patient it is difficult to draw a definite conclusion. Needs further multicenter, randomized control trial to validate the study and also needs to be tried on wounds of various etiology

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# Role of Mobile Telemedicine Kiosk for Tele-ICU Consultations During COVID-19 Period

Nishad K MS<sup>1</sup>, Ravi Kumar Chittoria<sup>2</sup>, Saurabh Gupta<sup>3</sup>, Chirra Likhitha Reddy<sup>4</sup>,  
Padmalakshmi Bharathi Mohan<sup>5</sup>, Imran Pathan<sup>6</sup>, Shijina K<sup>7</sup>, Neljo Thomas<sup>8</sup>

**Author Affiliation:** <sup>1,3,4,5,6,7,8</sup>Senior Resident, <sup>2</sup>Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**Corresponding Author:** Ravi Kumar Chittoria, Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**E-mail:** drchittoria@yahoo.com

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## Abstract

One of the most important steps in minimizing the spread of COVID-19 infection is social distancing. Telemedicine can of great help in implementing social distancing in health care. The Telemedicine consultation can be done with the help of Telemedicine Kiosk. The commercially available Telemedicine Kiosk are costly. Here in this article we are sharing our experience of using a telemedicine kiosk made from the materials already available in our department and how it was used for Tele-ICU consultations during COVID-19 lockdown period.

**Keywords:** COVID-19; Telemedicine Kiosk; Tele-consultations.

## Introduction

The COVID-19 has spread along the continents to become a pandemic very fast. COVID-19 has brought lot of stress on the health care workers, as they are among the high-risk category of getting infected with the COVID-19 and they also carry the risk of spreading the disease further to other

vulnerable patients admitted in the hospital. This leads to the increase in mortality of patients. Intensive care unit (ICU) has most number of such vulnerable patients. The most effective preventive method apart from hand washing and facial mask is to maintain social distance.

Telemedicine means ‘healing at a distance’<sup>1</sup> it bridges the gap between the doctors and vulnerable patients with the help of information technology. Telemedicine kiosks can be used for consultation between doctors and patients admitted in ICU especially in situation like COVID-19. But Commercially available telemedicine kiosk is costly, such kiosk are mostly unavailable in hospitals of developing countries. Free Telemedicine applications are available, but still such applications are still not popular among developing countries on a significant scale due to many reasons.<sup>2,3</sup>

This article shares the experience of using an indigenously made mobile telemedicine kiosk for Tele-ICU consultations during COVID-19.

## Materials and Methods

This study was conducted in the department of plastic surgery in a tertiary care institution during the COVID-19 lockdown period. Informed



consent was taken from all patients and ethical clearance obtained from the departmental ethical committee.

A Telemedicine kiosk was made using the material available in the ward; an unused trolley in the department of plastic surgery was cleaned and was given fresh coat paint. It was fixed with an unused IV stand. An old condemned flexible endoscope light source cable was used to mount the Web camera. The trolley was fitted with various health care-related digital equipment, like an infra-red digital thermometer, digital BP apparatus, digital stethoscope, digital glucometer, digital weighing machine, digital pulse oximeter, etc. A laptop and digital video camera were also used. And the Kiosk was connected to Institutional Wi-Fi. The duty nurse took the Kiosk inside the ICU and the consultant online examined the virtually real time (Fig.1) The resident checked the vitals of patients using the equipment fitted on the telemedicine kiosk and findings were conveyed to the consultant in real time (Fig.2) and the senior doctor evaluated the findings, discussed the case and necessary order modifications were given. The feedback was taken from the nurse present in the ICU and the participating doctors about the audio, video and the user-friendliness of the technology.

## Results

Feedback (Table 1) showed that, all the consultations and documents which were shown online were clear and voice was audible. Resident doctor inside the ICU and nurse could take the consultations clearly and implement accordingly.

During the study period, none of the patients got infected with COVID19, similarly none of the health care workers while using this technology got COVID19 disease.



Fig. 1: Telemedicine Kiosk In use In ICU.



Fig. 2: Tele ICU rounds transmitted real time to the Consultant.

Parameters	Excellent	Good	Bad
Audio Quality			
Video Quality			
Network Stability			
Easiness Of Use			
Overall Score			

## Discussion

Social distancing is one the important in the prevention of the spread of COVID-19. If adequate preventive steps not taken, health care workers can spread the disease to the patient or vice versa. It will certainly add on to the positive cases leading to increased mortality.

Telemedicine is the use of information technology tools for communication between patients and health care workers or among health care workers. Based on this principle of Telemedicine, attempt was made to create telemedicine kiosk in the department for the tele consultations during COVID-19 period. Tele consultations include; Tele-ward rounds, Tele-ICU rounds, Tele-burns ward rounds, Tele-emergency consultations, Tele-patient-attendant interactions as well as Tele-monitoring of patients or flaps. There are many other ways other than using a Kiosk, like using a mobile phone, PT camera, drone, etc. But advantages of using a kiosk is that the kiosk camera is more static, voice is more clear and most important is while using a kiosk there is only minimal contact of the equipment with patient or health care personal and another advantage is that it all necessary equipment for monitoring the patient like a thermometer, BP apparatus, Glucometer, weighing machine, pulse oximeter, etc. The disadvantages are it is big, wide, so can be bit difficult to be negotiated into tight spaces like in between beds.

The literature shows that this kind of practice is

already available and being used in developed countries. From remote monitoring of ICU patients. But in developing countries because of the high cost is a limiting factor. This study highlights the role of cost-effective mobile telemedicine kiosk used for tele-ICU rounds and was found to be effective.

The Tele-ICU rounds can be done using the following types of telemedicine application in practice such as:<sup>4,7</sup>

1. Store and forward (SAF) or Pre-recorded (Asynchronous) TM
2. Real-time or Video Conference (VC) (Synchronous) TM
3. Hybrid TM
4. Mobile or Cellular TM
5. Integration Model

### Conclusion

Telemedicine can play a vital role in providing teleconsultations like Tele-ICU consultations during COVID-19 and a Telemedicine kiosk may help in the prevention of the spread of the disease by helping to maintain a social distance.

#### *Limitation of the study:*

This study was done only at a single center, large randomized control study involving multiple centers is required to substantiate the result of the study.

**Disclosure:** None

**Conflict of interest:** None

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# Scalp and Calvarial Injury from Tiger Attacks: An Untouched Realm

Rohan Digarse<sup>1</sup>, Somil Jaiswal<sup>2</sup>, Manish Jaiswal<sup>3</sup>, Chhitij Srivastava<sup>4</sup>,  
Anil Chandra<sup>5</sup>, BK Ojha<sup>6</sup>

**Author Affiliation:** <sup>1</sup>Senior Resident, <sup>2,3</sup>Associate Professor, <sup>4,5,6</sup>Professor, Department of Neurosurgery, King George's Medical University, Lucknow, Uttar Pradesh 226003, India.

**Corresponding Author:** Somil Jaiswal, Associate Professor, Department of Neurosurgery, King George's Medical University, Lucknow, Uttar Pradesh 226003, India.

**E-mail:** dr.somil26@gmail.com

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## Abstract

**Introduction:** Tiger population has been dwindling over years and incidences of tiger attack scalp and calvarial injuries have been reported rarely. These injuries are life threatening and requires combined urgent neurosurgical and plastic surgery intervention.

**Methods:** This study retrospectively assessed cases of tiger attacks admitted in neurosurgery department from January 2016 to September 2019. Clinical, radiological and operative notes of these cases were retrieved from records and analysed.

**Results:** Five patients were treated during the study period. All of them were males. Three patients had Bilateral scalp injury whereas two had unilateral injuries. Three patients had undergone debridement craniectomy and repair of dura and scalp. One patient had to undergo occipital artery based transposition flap with split skin grafting. Another patient had to undergo local wound debridement and galeal underscoring for scalp suturing. All patients were doing well at the time of discharge.

**Conclusion:** Scalp and calvarial injury from tiger paw injury are rare and may cause substantial scalp loss along with depressed skull fracture. This type of injury requires team effort with plastic surgery team for flap transposition or skin grafting.

**Keywords:** Calvarial injury; Glasgow coma scale; Depressed skull fracture; Split skin graft.

## Introduction

Scalp and Calvarial injury owing to animal attacks are routinely underestimated and neglected in general practise. Wild animal attack injury are a rare cause of serious public hazards in the community. Dog bites are the by far the most common animal bite wound routinely seen in practise.<sup>1</sup> Injuries from other animals like cats, pigs, camels, horses, cows, donkeys have also been reported in literature.<sup>2</sup> Injuries range from superficial to deep wounds including contusions, lacerations etc and injuries to muscles, nerves, vessels, organs, organ systems and bone fractures. Almost all reports found in the literature are about pet animals and reports about injuries caused by wild animals particularly tigers are rarely reported, even rarer are reports of head injury caused by tiger attacks.<sup>3</sup> There are approximately 2967 tigers in India (according to 2018 data). We at our institute, have dealt with five tiger attack patients from 2016-2019. The Dudhwa national park located near Lakhimpur Khiri in UP is a house to about 106-118 tigers (according to 2010 data). Majority of injuries have been reported from areas nearby and surrounding this area.

In this study retrospective analysis of the operated patients of Scalp and Calvarial injury owing to tiger attacks was performed.



## Material and Methods

Clinical, radiological and operative records of the patients with scalp and calvarial injury following tiger attacks were retrieved from Neurosurgery Department database from January 2016 till September 2019. Five cases with injury following tiger attack were analysed and details are mentioned below.

**Case 1:** A 25 yrs. old male was admitted with us with a history of tiger attack at Lakhimpur khiri on 28/11/2016. Patient presented to us in full Glasgow Coma Scale (GCS 15) without any neurological deficit. However there was a 15\*5 cm laceration and scalp loss over the left fronto-temporo-parietal region. There was no associated Brain matter or CSF leak. Patient was managed with wound toileting, debridement and primary closure of scalp after galeal underscoring. Patient was stable and was discharged to local hospital on antibiotics.

**Case 2:** A 50 yrs. old male reported in emergency with tiger attack injury at Pilibhit on 18/8/2017. Patient presented to us in a poor condition with GCS of 10, but no hemiparesis, CT was suggestive of B/L temporo-parietal compound depressed fracture with underlying contusion with right radius fracture. Patient was operated for left temporo-parietal debridement craniectomy with right temporal debridement craniectomy with augmentation duroplasty using pericranial patch and glue on 21/7/17. Patient improved post operatively and was discharged in full GCS and was fine in follow up visits.

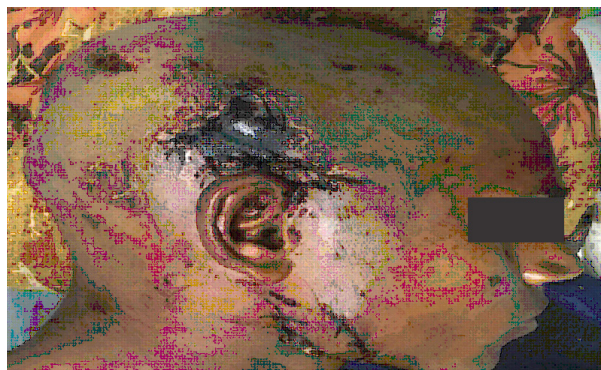
**Case 3:** A 30 yrs old male presented with tiger

attack and bite injury on 23/9/17 with gcs of 9 without any other associated injuries. On evaluation CT scan was suggestive of right temporal and left temporo-occipital compound depressed fracture with brain matter leak. Patient was operated upon and right temporal with left temporo-occipital debridement craniectomy with dural repair using Tensor Fascia Lata. Post-operatively patient developed surgical site infection from left sided scalp wound which was managed conservatively with regular dressings. Patient was discharged in GCS 15 and was doing well in follow up visits.

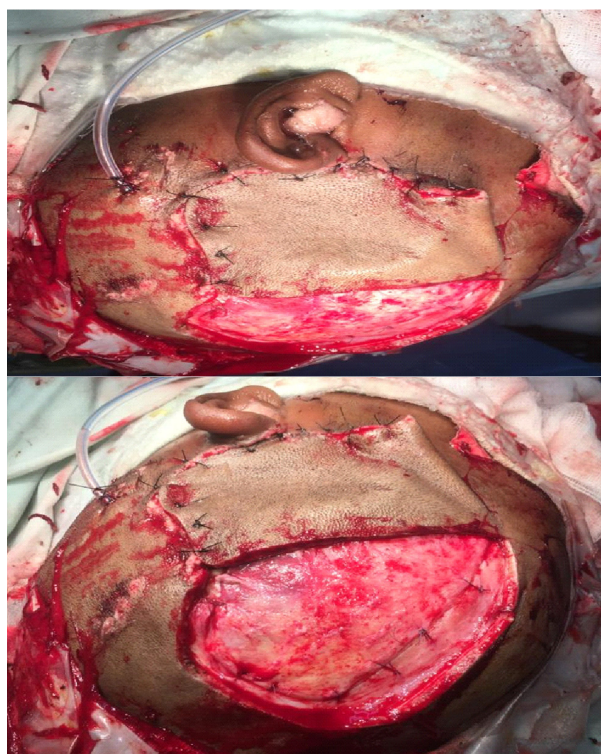
**Case 4:** A 45 yrs old male presented with scalp and calvarial injury following Tiger attack on 7/2/19 at Lakhimpur khiri. Patient was admitted in full GCS but with left orbital injury and vision loss on left side. CT was suggestive of left parietal fracture with brain matter leak. Patient was operated and left parietal debridement craniectomy with contusectomy with dural repair using pericranium and glue. Patient was discharged in full GCS without any post op complications and had uneventful follow up.

**Case 5:** A 30 yrs old male patient admitted to us with Tiger attack injury while going to the market enroute on 11/9/2019 at Bahraich. Patient presented to us in a GCS of 14 without any focal deficit but CT scan suggestive of bilateral temporo-parietal depressed fracture with brain matter leak. Patient underwent surgery and Bilateral temporoparietal debridement craniectomy was done with left sided transposition flap with Split skin grafting in conjunction with plastic surgery team. Post operatively patient recovered to GCS 15 with healed wound and graft well taken.

Patient Details	Injuries	Procedure	Complications
1. 25y /M	15×5 cm contused lacerated wound with scalp loss over left fronto-temporo-parietal region	Local wound debridement and primary scalp suturing with galea underscoring.	None
2. 50y/M	Bilateral temporo-parietal compound depressed fracture with brain matter leak	Left temporo-parietal and right temporal debridement craniectomy with Augmentation duroplasty with pericraium patch and glue	None
3. 30y/M	Right temporal depressed fracture with left temporo-occipital depressed fracture with Brain matter leak	Right temporal debridement craniectomy with left temporo-occipital debridement craniectomy with augmentation duroplasty using Tensor Facsia Lata.	SSI left side scalp wound. Settled on conservative management and dressing.
4. 45y/M	Left parietal cpmound depressed fracture with contusion with brain matter leak	Left parietal debridement craniectomy with Augmentation duroplasty using Pericranium	None
5. 30y/M	Bilateral temporo-parietal depressed fracture with Brain matter leak	Bilateral temporo-parietal debridement craniectomy with left side occipital artery based transposition flap with Split Skin Graft from right thigh	Surgical site infection of right side wound treated conservatively



**Fig. 1:** Pre-op Image of Right parietal Compound fracture wound with stitches at local hospital



**Fig. 2:** Intra-op pictures of transposition flap for site of debrided wound and split skin graft for raw area



**Fig. 3:** 7<sup>th</sup> day Post op Photo of wound site

## Discussion:

Wild animals e.g. tigers, lions etc usually hunt by themselves, mostly in the night. Tigers can leap upto a massivedistance of 200 feet, biting the target on the neck. It then takes the target to some hidden spot. Though tiger attacks on humans are unusual, they are increasing now a days because people have started encroaching upon their natural habitats. Most of the attacks in our series have occurred near the Dudhwa national park which is a habitat for tigers. It was found that most tigers that eat humans are sick or injured due to one cause or the other and unable to kill their prey in the jungle. Once they have acquired a taste for human flesh however, they will in all likelihood continue to kill them. Though man eating tigers are a rarity in other parts of Asia, they are notorious in Sundarbans. Sometimes, tigers come out of the jungle into the neighbouring village and attack people. Tiger attack injuries on scalp and calvaria are life threatening and on other body regions are devastating. Tiger attack surviviour are lucky to live after such grievous injuries. No other series has been reported in the literature describing scalp and calvarial injuries follwoing tiger attacks and their management. This series from our centre underlines the need for the scalp and calvarial injuries to be treated on urgent basis requiring neurosurgical and plastic surgery team.

## Conclusion

Scalp and calvarial injuries following tiger attacks are rare but life threatening and many times requires urgent neurosurgical intervention. Tiger paw injury may cause extensive scalp loss which may require assistance of plastic surgeon for transposition or grafting. These injuries may require a combined effort of Neurosurgery and Plastic surgery team.

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## Role of Low Level Laser Therapy (LLLT) Inamputation Stump

Neljo Thomas<sup>1</sup>, Ravi Kumar Chittoria<sup>2</sup>, Saurabh Gupta<sup>3</sup>, Chirra Likhitha Reddy<sup>4</sup>,  
Padmalakshmi Bharathi Mohan<sup>5</sup>, Shijina K<sup>6</sup>, Imran Pathan<sup>7</sup>, Nishad K<sup>8</sup>, Daisy Loyola<sup>9</sup>

**Author Affiliation:** <sup>1,3,4,5,6,7,8</sup> Senior Resident, <sup>2</sup>Professor, <sup>9</sup>Observer, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**Corresponding Author:** Ravi Kumar Chittoria, Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

**E-mail:** drchittoria@yahoo.com

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### Abstract

Non healing wound is a common problem encountered by plastic surgeon. There various causes due to which the wound becomes non healing and fails to heal. However there is no well-established method that can accelerate the wound healing rate. Various modalities are used to accelerate the rate of healing, like platelet rich plasma, local infiltration of insulin, irritant substances, laser therapy *et al.* This article highlights the role of low level laser therapy in management of amputation stump.

**Keywords:** LLLT; Amputation Stump.

### Introduction

Adult wound healing comprises of three stages: the inflammatory phase, the proliferative phase, and the remodelling phase. These 3 stages have to occur in sequentially to result in healing of wound. Wound bed preparation is a new concept and can be summarized with the acronym T.I.M.E, T for tissue: non-viable or deficient. I for infection/inflammation, M for moisture balance. E for epidermis which was changed later to E for edge. Chronic wounds are difficult to manage and forms an important part of plastic surgery practice. They often lack growth factors, are deficient in

vascularity and granulation tissues and have to be supplemented with adjuncts to aid in wound healing. The wound bed preparation is an important part of wound healing in a chronic wound and includes supplementation of growth factors and facilitating vascular growth into the wound for a faster healing. The modality chosen here is low level laser therapy. It is said to facilitate wound healing by improving granulation tissue formation, collagen synthesis, neovascularization *etc.*

### Materials and methods

This study was conducted in the department of Plastic Surgery at tertiary care center after getting the departmental ethical committee approval. Informed written consent was taken from the patient. The details of the patient in study are as follows: 37 year old female with no known comorbidities with h/o road traffic accident 4 months back and underwent right below knee amputation due to vascular injury and degloving injury of the left lower limb for which serial debridement was done in cardiothoracic and general surgery department. Now, the patient presented to plastic surgery department with extensive raw area over the left lower limb and non-healing ulcer over the right below knee amputation stump. (fig. 1)

After debridement, LLLT (fig. 2,3) was given to the wound bed in each session. Gallium Arsenide (GaAs) diode red laser of wavelength 650 nm, frequency 10 kHz and output power 100 m W was used as a source of LLLT. It is a continuous beam laser with an energy density of 4 J/cm<sup>2</sup>. Machine delivers laser in scanning mode (non-contact delivery) with 60 cm distance between laser source and wound. In each session, the wound was given laser therapy for duration of 125 second followed by non-adherent dressing. Regular LLLT was given once every three days for a total of 6 session. It was also supplemented with various modalities like prolotherapy, autologous platelet rich plasma, insulin therapy

## Results

The wound bed showed good granulation tissue (fig. 4). LLLT is found feasible as adjuvant modality of wound bed preparation.



Fig. 1: Wound over the amputation stump

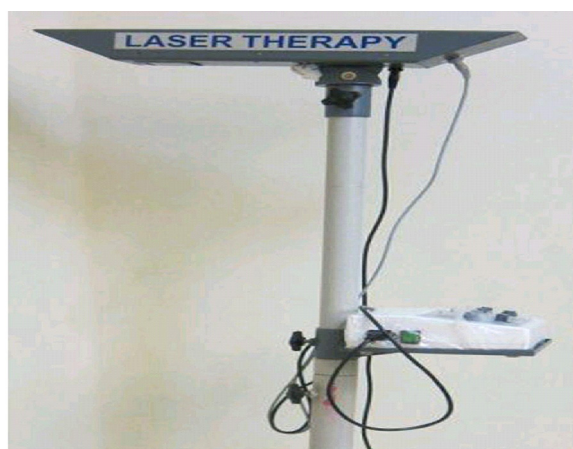


Fig. 2: LLLT Machine

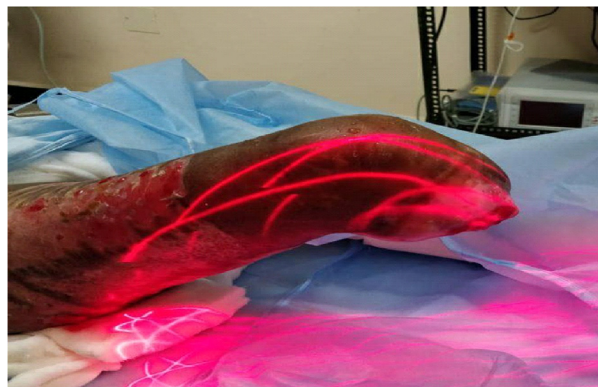


Fig. 3: LLLT given to the Amputation Stump



Fig. 4: Healing Wound Bed

## Discussion

LASER can be abbreviated as “light amplification by stimulated emission of radiation”. Low-level lasers has a power density at less than 500 mW/cm<sup>2</sup>.<sup>2</sup> It is defined as low level laser as the energy used is very much less than that is used for cutting, ablation therapy. Low-level laser therapy (LLLT) is used as an adjuvant to available therapy, especially in patients with acute and bloody ulcers.<sup>3</sup> LLLT is a form of phototherapy that uses electromagnetic radiation capable of generating energy to interact with living tissues. It produces photochemical and photophysical effects and does not produce heat, with the intention of reestablishing cell homeostasis. Essentially, light energy is delivered topically in a controlled manner and is absorbed by photo-absorbers (chromophores) that transform it into chemical energy.<sup>4</sup>

Positive effects include acceleration of tissue repair, improved formation of granulation tissue, accelerated wound contraction, decreased inflammation, modulation, and pain reduction.<sup>5</sup>

According to the literature, low-energy photo missions given at a wave length of 600 nm to 900 nm can accelerate cell proliferation and the wound

healing processes.<sup>6</sup> It is thought to: Stimulate respiratory chain components such as flavin and cytochromes which increase adenosine triphosphate (ATP) synthesis,<sup>7</sup> thus increasing the rate of mitoses and increasing fibroblast numbers,<sup>8-12</sup> promote collagen and elastin production, leading to better re-epithelialisation,<sup>13</sup> Stimulates microcirculation and dilatation of the capillaries and neovascularisation to increase tissue oxygenation,<sup>14</sup> release mediator substances such as histamine, serotonin and bradykinin to influence macrophages, rejuvenate lymphatic vessels.

*Limitations:* The study was done on a single patient and needs large population based study to apply in practice.

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# Goldenhar Syndrome with Radial Club Hand: An Unusual Presentation

Vinayak Chavan<sup>1</sup>, Vijay Mahantesh Pujari<sup>2</sup>

**Author Affiliation:** <sup>1,2</sup>Consultant Plastic Surgeon, Department of Plastic Surgery, Nara Vigyana Multispeciality Clinic, Keshwapur, Hubli, Karnataka 580023 India.

**Corresponding Author:** Vijay Mahantesh Pujari, Consultant Neurosurgeon, Department of Neurosurgery, Nara Vigyana Multispeciality Clinic, Keshwapur, Hubli, Karnataka 580023 India.

**E-mail:** dr.vkchavan@gmail.com

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## Abstract

Goldenhar syndrome also known as Facioauriculovertebral sequence is a rare congenital condition presenting with the asymmetry of the face, under developed ear, cleft lip/palate and abnormalities of the spine. In addition, Goldenhar can affect the heart, kidney, lungs and limb abnormalities. We would like to share one such case presented to us with a constellation of features of Goldenhar syndrome along with a contralateral radial club hand.

**Keywords:** Goldenhar syndrome; Hemi facial microsomia; Radial Club hand; Radial deficiency.

## Introduction

Goldenhar syndrome also known as Facioauriculovertebral sequence, oculo-auriculo-vertebral (OAV) syndrome was first described by Dr. Maurice Goldenhar in 1952 as a triad of epibulbar dermoids, preauricular appendages and pretragal fistulae.<sup>1</sup> Since Goldenhar's original description, other manifestations have been added, including vertebral abnormalities, upper eyelid colobomas, subconjunctival lipomas, ear anomalies, hearing loss, unilateral Facial hypoplasia, micrognathia, cleft or high-arched palates, and congenital cardiac anomalies.<sup>2</sup>

The incidence has been reported to be 1:3500-1:5600 with a male to female ratio of 3:2.3.

The condition is sporadic in 90% of cases 4 and positive family histories have been reported (10%) suggesting autosomal dominant or recessive inheritance.

The underlying cause of Goldenhar disease is poorly understood, the pathophysiology is believed to be occlusion of the stapodial artery during organogenesis affecting structures that originate from the first and second branchial arch.<sup>5</sup>

Radial aplasia or hypoplasia is another rare congenital abnormality with an estimated live birth incidence of 1:5000. In addition to an abnormal radius and/or ulna, there may also be anomalies of the humerus, scaphoid, trapezium, metacarpals, and thumbs as part of a wide spectrum called 'radial ray malformations'.<sup>6</sup> From the late 1800s, the varied etiology of congenital malformations has been observed, with bilateral forearm abnormalities being more often associated with an underlying genetic etiology than unilateral lesions.<sup>7</sup>

## Case Report

A 6-year-old boy reported with the complaint of deformity of the left wrist. The patient was born to second-degree consanguineous parents and his younger sibling is normal. History revealed pregnancy and birth were uneventful. Speech milestones were delayed. The performance in school was satisfactory. On examination, the patient had facial asymmetry, hypoplasia of the mandible,

and retrusion of the midface with loss of malar prominence on the right side. The angle of the mouth was deviated to left. Low facial nerve palsy. (Fig. 1) The base of the nose was broad, low set underdeveloped right ear with atresia of external auditory meatus with preauricular tags. (Fig. 2)

Intraoral examination revealed a scarred soft palate (operated for cleft of the soft palate at the age of 10 months) and Angle's class III malocclusion with crowding of both maxillary and mandibular anterior teeth and anterior open bite. The child had chronic generalized gingivitis associated with poor oral hygiene.

The patient had type 4 left radial club hand with a hypo plastic thumb with contracted first web space and limited movements of fingers. (Fig. 3) The patient was also noted to have hypo plastic ribs on the left side with poorly developed pectoralis muscles. (Fig. 4)

The patient had thoracolumbar scoliosis and webbing of the neck (Fig. 5) Cardiac evaluation, eye examination was normal.



Fig. 1: Facial asymmetry with facial nerve involvement



Fig. 2: Low set ear with preauricular tag

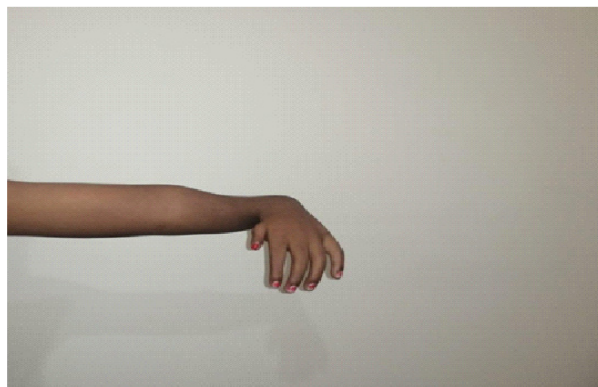


Fig. 3: Type 4 Radial Club hand



Fig. 4: Hypoplastic left hemithorax

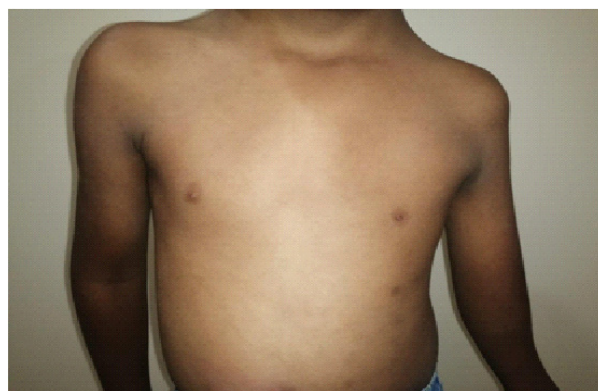


Fig. 5: Scoliosis with webbing of the neck

## Discussion

The criteria for the diagnosis of Goldenhar's syndrome consisted of an eye abnormality (lipoma, lipodermoid, epibulbar dermoid, or upper eyelid coloboma) associated with the ear, mandibular, or vertebral anomalies (two of the three).

It has been estimated that epibulbar dermoids occur unilaterally in one-third of patients with Goldenhar's syndrome. review of the literature suggests, 23% were bilateral, 53% were unilateral,

and 24% had no epibulbar dermoid.<sup>8</sup>

Goldenhar's syndrome represents the spectrum of Hemifacial Microsomia (HM) which is predominantly unilateral malformation of craniofacial structures that developed from the first and second branchial arches. However, both HM and the Goldenhar syndrome may represent gradations in the severity of a similar error in morphogenesis.<sup>7</sup>

Various other anomalies associated are.<sup>1</sup> Cardiovascular system: Tetralogy of Fallot. Dextrocardia, transposition of great vessels, right bundle branch block, pulmonary stenosis, atrial septal defect.<sup>2</sup> Central nervous system anomalies hydrocephalus, meningoencephalocele, mental retardation.<sup>3</sup> Others include renal agenesis, inguinal hernia, hemangiomas, rectovaginal fistula, and club feet.<sup>3</sup>

Radial club hand is a rare association with Goldenhar's syndrome. The most common anomalies observed were hypoplasia of thumb and hypoplasia/agenesis of the radius<sup>9</sup> significantly associated with short stature.<sup>10</sup>

Radial ray deficiency with goldenhar syndrome is a rare association, our case in addition to the existing number.

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