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CASE REPORT

Eopa: An Uncommon Extraoral Approach for Common Oral Problems

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ABSTRACT

Newman and Friedman proposed a new technique using extraoral approach to take periapical radiographs in certain patients who can't tolerate film or sensors inside their mouth. Here we are presenting some cases using extraoral periapical approach for patients with trismus, patient having gag reflex and pediatric apprehensive patients in which use of intraoral periapical radiography is not possible. This technique can be used as alternative to intraoral periapical technique in certain patients with comparable diagnostic value but can't replace it in routine dental practice.

Aims: To evaluate diagnostic importance Extraoral periapical radiographic technique

Settings and Design: Observational study

Methods and Material: The study was conducted in oral radiology department using Bio-Dent-1070 D (Biodent Bio medicare Imaging) dental x-ray unit; 70 kvp, 10 mAs, 0.03-0.05 sec, 2mm aluminum filtration.

Results: The radiographs obtained by extraoral periapical radiographic method showed satisfactory diagnostic quality as compared to conventional intraoral radiographs

Conclusions: Extraoral periapical technique can be advisable in certain situations where intraoral use of films or sensors are not possible but it can't replace conventional intraoral periapical technique. More standardization is recommended to get better diagnostic images in this technique.

KEYWORDS

• Periapical Radiography • IOPA • EOPA • Oral radiology

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INTRODUCTION

Intraoral periapical radiography (IOPA) is commonly used technique for diagnosing various dental as well as periapical pathologies. Common indications are dental caries, root morphologies before extraction, impacted tooth, periapical pathology, endodontic procedures, periodontal bone loss and so on. Though IOPA is commonly used technique, many patients do not tolerate film or sensor intraorally very comfortably inside the mouth because of various reasons.[1,2] These reasons may be trismus, uncooperative pediatric patients, gag reflexes etc. Newman and Friedman in 2003 developed extraoral periapical radiograph (EOPA) technique for such patients.[3] Later Chen *et al* in 2007 made use of sensor beam alignment in this technique for proper aiming purpose.[4] Present study attempts to makes use this technique in various cases.

Subjects and Methods: The study was conducted in oral radiology department using Bio-Dent-1070 D (Biodent Bio medicare Imaging) dental x-ray unit; 70 kvp, 10 mAs, 0.03-0.05 sec, 2mm aluminum filtration. For maxilla patient was positioned upright. RVG film sensor was placed on external surface of cheek using cotton roll to make the plane of the sensor perpendicular to the direction of x-ray beam.[2] Angulation was kept between -20 to -30 degrees for maxillary radiograph. Additionally, care was taken to keep central beam of x-ray perpendicular to the plane of the sensor. For mandibular teeth patient was asked to raise the chin so that mandibular plane will be perpendicular to the floor. Angulation of -10 to -15 degree was used making sure plane of the perpendicular to the central x ray beam. In this paper we have shown few cases in which intraoral use of film sensor was not possible due to discomfort and uncooperative patients. Aiming devices or film holding receptors were not used in the study for same purpose as it will increase the discomfort for the patient.

RESULTS

Case 1

A 40-year female came to the department of oral medicine and radiology with chief complaint of pain and restricted mouth opening in upper right back region of jaw. On clinical examination tooth 18 was grossly carious and buccally placed. Patient had history of recurrent cheek bite with same side.

Patient undergone extraoral radiographic examination which showed carious and vertically impacted 18 with adequate radiographic diagnostic value. Patient gave very positive feedback about this investigation and was happy with the technique as the sensor was placed extraorally and no discomfort felt by the patient.

Figure 1 A

Figure 1 B

Case 2

A 32-year male came to the dept of oral medicine and radiology having severe pain in lower right back region of jaw. On clinical examination it was noted that 48 is grossly carious and impacted. There was inflamed pericronal flap with pus discharge. Halitosis was present. All suggestive of severe pericoronitis. We tried taking intraoral periapical radiograph for patient to see the region of 48. Patient was having severe gag reflex while we put sensor inside his mouth. As conventional intraoral radiography was not possible in this case, we performed extraoral periapical radiographic

technique. Patient was much comfortable to this approach. Radiograph revealed useful diagnostic information of impacted and carious 48 with acceptable diagnostic value.

Figure 2 A

Figure 2 B

Case 3

Child patients are usually not cooperative to place films or sensors inside their mouth. A 7-year-old child was reported with complain of pain and swelling in lower right back region of jaw. On clinical examination it was found that mandibular right deciduous 1st and 2nd molar was grossly carious with associated swelling in buccal vestibule suggestive of abscess. Patient was apprehensive and was not ready to keep sensor intraorally. We decided to use extraoral technique. Here for child patient angulation used was still lessor than adult patient. We kept vertical angulation between -5 to -10 degree. Exposure time was also reduced to 0.02 seconds considering bone density with respect to child patient. Radiograph revealed severe caries with 84, 85. Caries was extending till furcation area. Extraction of these teeth followed by space maintainer was decided as treatment plan for this after seeing radiograph. Radiograph showed acceptable diagnostic quality. The patient was happy to cooperate with this extraoral approach with reduced anxiety level.

Figure 3 A

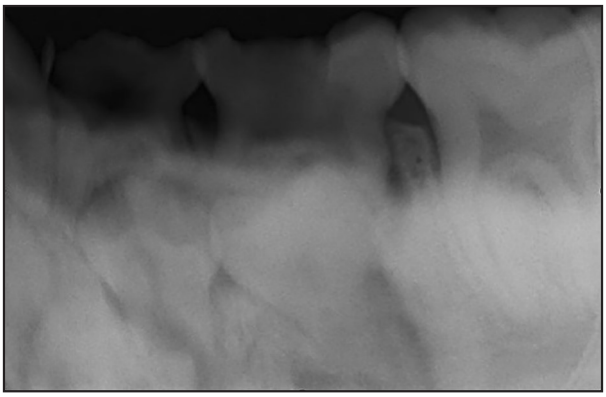

Figure 3 B

DISCUSSION

Conventional intraoral periapical radiography is widely used technique in day to day practice in dentistry. Sometimes patient feels discomfort with the use of bulky sensor or film inside the mouth and especially problem arises with uncooperative pediatric patient, Patient having trismus, patient with gag reflex, obtaining radiographs for 3rd molars, disabled patient etc.[1] first use of extraoral technique was done by Fisher in 1974 wherein he used occlusal films for obtaining images of 3rd molars using high

kVp (90 kVp).[5] In this study we have used RVG sensor which significantly reduced radiation exposure and used x-ray machine with low kVp (70 kVp). This was found sufficient to obtain comparable diagnostic quality images with that of conventional intraoral periapical radiographic technique. Extraoral technique can't be used in place of Intraoral technique in daily dental practice since it has too much overlapping of structures in the path of x-ray beam resulting in image distortion and less resolution but still use of it can be justified in some situations as mentioned in above case scenarios. Newman and Friedman used greater amount of angulation (-55 degrees for maxillary teeth and -35 degrees for mandibular teeth).[3] A lesser angulation was suggested by chen *et al* (-20 to -30 for maxillary teeth and -10 to -15 for mandibular teeth).[3] In our study angulation used was similar to that of suggested by chen *et al*; however, angulation changes with respect to anatomy and facial height of the patient. For paediatric patient we used lesser angulation (-5 to -10 degrees) due to lower facial height of the patient. This technique has been found effective in certain situations like trismus, paediatric patients, apprehensive patients, trauma, patients with gag reflex etc.[1,3,4] Advantage of this technique are increased patient acceptance due to avoidance of patient discomfort and images having acceptable diagnostic accuracy.[3,4] Disadvantages of this technique are image distortion due to overlapping of structures resulting in less resolution and images of anterior teeth can't be obtained.

Recent advances in imaging technique can overcome above mentioned situations like use of OPG and CBCT but these are quite expensive and require more amount of radiation exposures.

In conclusion Extraoral periapical technique can be advisable in certain situations where intraoral use of films or sensors are not possible but it can't replace conventional intraoral periapical technique. More standardization is recommended to get better diagnostic images in this technique.

CONCLUSIONS

Extraoral periapical technique can be advisable in certain situations where intraoral use of films or sensors are not possible but it can't replace conventional intraoral periapical technique. More standardization is recommended to get better diagnostic images in this technique.

Conflicting Interest: Nil

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