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Original Research

Management of cystic surgical wound of the mandible: A comparative study analyzing closed versus open wound healing

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ABSTRACT

Background: The impact of surgical wounds on patients' wellbeing and the burden it places on healthcare professionals and financial resources provide opportunity to improve management strategies and prevent complications.

Objective: To assess the effect of open wound healing on postoperative trismus, pain; and to record complication(s) of wound healing after enucleation of periapical periodontal (radicular) cysts of the mandible.

Patients and methods: This was a prospective study of 76 patients (54 males, 22 females; aged 18–65 years, mean 37.3 ± 13.7). The subjects were randomly assigned into two different treatment groups of closed (control, $n = 38$), and open (experimental, $n = 38$) wound healing. The subjects were treated under the same surgical protocol except that the wound in the control group were sutured. Trismus and pain were evaluated on the second, fifth, 10th and 14th days postoperatively in both groups.

Results: Postoperative trismus was significantly less in the experimental group on the second and fifth postoperative days ($p = 0.0000$). Pain was found to be significantly less on the second, fifth and 10th days postoperatively in subjects with open wound when compared with closed ($p < 0.05$). The bigger the size of cystic lesion, the greater the postoperative trismus and pain ($p = 0.001$). Also, four (10.5%) subjects in control group developed wound dehiscence.

Conclusion: This study show that open wound management technique cause less postoperative trismus, pain and complication(s). This will suggest that patients' wellbeing in the postoperative period after enucleation of periapical periodontal cysts is better with this method.

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1. Introduction

The enucleation of periapical periodontal (radicular) cysts is a common surgical procedure carried out in the oral cavity [1]. Periodontal cyst occurs as a result of increased involvement of the dentition in many pathological processes in the oro-facial region causing the jaws, particularly the mandible to be prone to surgical assaults with its attendant adverse consequences. Surgical procedures always leave a wound, and the surgeons' responsibility to

patients does not end until the wound created has healed satisfactorily with minimal discomfort and complications.

Over the centuries, surgery has been based on scientific principles that evolved from both basic research, and trial and error. In the last 25 years wound care knowledge and treatments, as well as information in the literature pertaining to wound and patient care options have widened rapidly. Consequently, many interventions, including new medications, strategies and technologies, are being used to help achieve uneventful wound healing while minimizing discomfort and complications. However, even if it is difficult to come to definite conclusions, due to the variability of the design of different studies, the postoperative discomfort and complications identified with oedema, pain, trismus following surgeries in the oro-facial region is sometimes influenced by various factors such as the difficulty of the surgical procedure, age, gender, size of lesion, extent of incision and surgery, experience of surgeon, medical condition, compliance to the postoperative regimen by the patients among others.

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The impact of surgical wounds on patient health and wellbeing, and the burden it places on health care professionals, organizations and financial resources provide an opportunity to improve management strategies [2,3]. Surgical wounds in the oro-facial region sometimes cause suffering due to pain, trismus, infection, nausea, fatigue, psychological disturbances, loss of function, financial costs and even death [4–8]. It has been reported that delayed surgical wound healing frequently results in loss of productivity, prolonged hospital stay and increased cost on the part of the patient [9,10]. While open wound management technique is gaining popularity in other parts of the globe, oral surgeons in Nigeria have not fully embraced the method. This study compares closed and open wound healing techniques in subjects who have undergone enucleation of periapical periodontal cysts of the mandible over a period of five years in a Nigerian Tertiary Hospital.

2. Patients and methods

The 76 subjects studied had periodontal cysts occurring in the premolar–molar region of the mandible and were treated by enucleation between January 2008 and December 2012 at the Dental and Maxillofacial Surgery Department of the University of Calabar Teaching Hospital, Nigeria. Approval was obtained from the Research Ethics Committee of the hospital before the commencement of the study, which followed the 1975 Declaration of Helsinki on medical protocol and ethics, and each patient was required to sign a consent form.

The diagnostic criteria for periapical periodontal cyst were based on WHO classification of 2005 [11]. These include among others: (1) Presence of swelling around the body of the mandible. (2) Presence of necrotic tooth/teeth in the area of the swelling. (3) Aspiration of straw or brownish coloured fluid from the lesion. (4) Posterior–anterior jaws and lateral oblique mandibular radiographic views showing area of radiolucency, outlined by a radio-opaque margin. (5) Biopsy report of the lesion.

This was a single-blinded randomized study to analyze open versus closed wound healing using postoperative variables like trismus, pain; and complication(s) that arose in the postoperative period. Patients with limited mouth opening, pain, infection and conditions such as diabetes mellitus, sickle cell disease, immune compromise, malnutrition, vascular disease, on steroid therapy/oral contraceptives, smoking, radiation, and other local and systemic medical conditions adversely affecting wound healing or bone physiology and metabolism were excluded from the study. Following enucleation of the cysts and biopsy, those subjects with mandibular continuity defects, infected periodontal cysts, other odontogenic cysts and cysts associated with tumours and other allied lesions were also excluded from the study. Those whose oral hygiene were scored poor or fair using the Gross plaque scoring method were required to undergo gross scaling before the surgical procedure. The subjects were divided into two groups: A and B, and were assigned into each group after the surgery.

The patients were treated under general anaesthesia by the same surgeon/assistant in the same operating theatre. The surgical procedures carried out in both groups to treat the periapical periodontal cysts were raising a three sided (trapezoidal) mucoperiosteal flap, osteotomy/osteotomy of the overlying cortical bone under copious irrigation with 0.9% saline, extraction of the necrotic premolar/molar teeth and enucleation of the cystic lining (Figs. 1–4). The group A patients (control) comprised those subjects whose mucoperiosteal flaps were sutured over the bony cavity with interrupted 3/0 vicryl sutures after wound debridement and haemostasis (Fig. 3). The group B (experimental) patients were those whose surgical wounds were dressed with ribbon gauze impregnated with tincture of benzoin compound (TBC) after local

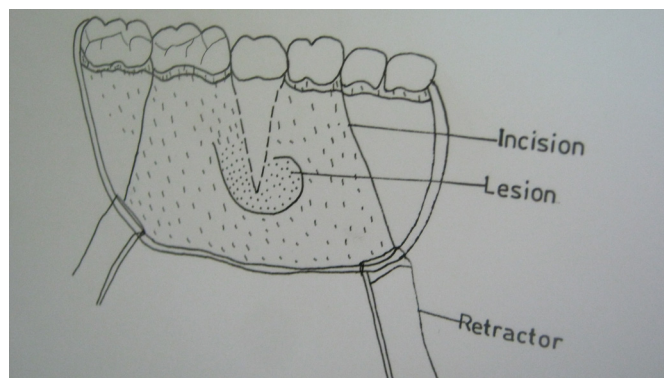


Fig. 1. Outline of incision for raising three-sided (trapezoidal) mucoperiosteal flap for cystic lesion <2 cm in the premolar–molar region of the mandible.

debridement and haemostasis, and the mucoperiosteal flap was used to cover the dressing without suturing (Fig. 4). The ribbon gauze was large enough to cover the circumference of the surgical wound and it was tucked down to its bed. The subjects in the two groups were placed on antibiotics (oral Clindamycin 150 mg × 12 hourly for 10 days), and non-steroidal anti-inflammatory analgesic (oral Naproxen sodium 550 mg × 12 hourly for 5 days) immediately postoperatively.

Following treatment, the patients were reviewed during the follow-up period by the same oral and maxillofacial surgeon. For the patients in Group B, the dressings were to be changed on the 7th day, after irrigation of the wound with normal saline and repeated on the 14th day post-operatively before discontinuation.

The clinical variables documented in a proforma questionnaire were patients' age, gender, size of cystic lesion, trismus, pain and complication (s) during the postoperative period. The subjects were evaluated for trismus and pain in a blinded manner by a single examiner preoperatively (baseline), and on the postoperative second, fifth, 10th and 14th days. Using calibrated calliper, trismus was evaluated by measuring the distance between the incisal edges of the upper and lower central incisors at the maximum mouth opening in millimetre preoperatively and postoperatively. The difference between each postoperative and the baseline measurement was regarded as the trismus for the day under consideration. Pain intensity was evaluated using a 10-cm (result recorded in millimetre) level visual analogue scale (VAS) with the subject placing a mark on the scale to show an intensity range from no pain (0) to severe/unbearable pain (10).

The data obtained were statistically analyzed using EPI INFO 7 software package. Chi square (χ^2) test compared the proportion of descriptive variables between the two study groups, whereas

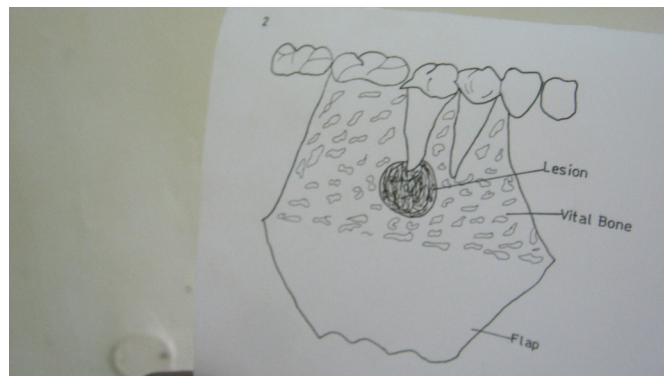


Fig. 2. Raised three-sided (trapezoidal) mucoperiosteal flap and exposure of cystic lesion related to 2nd premolar tooth (right).

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