

Postoperative Wound Infiltration with Local Anaesthetic after Enucleation of a Large Periapical Cystic Lesion: A Case Report

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Abstract The periapical cyst arises from epithelial remnants stimulated to proliferate by an inflammatory process originating from pulpal necrosis of a non-vital tooth. This condition is usually asymptomatic but if the cyst does become large, symptoms such as swelling may be observed. Although small cystic lesions will typically heal with nonsurgical endodontic therapy, larger lesions may need surgical intervention. Effective postoperative analgesia is important in surgical enucleation of large periapical cysts from the patient's viewpoint and can also improve clinical results. Pain free postoperative healing is desired by every patient. Wound infiltration with local anaesthetics is a simple, effective and inexpensive means of providing good analgesia for a variety of surgical procedures without any major side-effects. Continuous local anaesthetic infusion of a surgical wound using a catheter can provide a longer duration of analgesia.

Keywords: analgesia, periapical cyst, enucleation, catheter, local anaesthetic

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1. Introduction

Traumatic injuries to the teeth are often followed by pulpal necrosis. If microbial infection occurs, a periapical lesion may develop, possibly evolving into a chronic inflammatory lesion. Periapical or radicular cysts are inflammatory jaw cysts affecting teeth with infected and necrotic pulp. These cysts occur as the direct sequel of chronic apical periodontitis. Although the reported prevalence of cysts developing from apical periodontitis lesions varies from 6 % to 55 %, their actual prevalence is found to be under 20 %, according to investigations based on serial sectioning and stern histopathologic criteria [1].

Most radicular cysts develop slowly and do not become very large. Patients do not experience pain unless acute inflammatory exacerbation is present. If the cyst does become large, symptoms such as swelling, mild sensitivity, tooth mobility and displacement may be observed. The affected tooth is nonresponsive to thermal and electrical pulp tests [2] the management of large cystic lesions may involve surgical intervention such as a decompression or a marsupialization or even enucleation.

Postoperative analgesia is a major component of perioperative care and local anaesthetic (LA) techniques are more effective than systemic analgesia regardless of the operation and mode of delivery [3]. The success of early postoperative discharge is likely coupled with an accurate

management of pain [4]. Local anaesthetic wound infiltration is widely recognized as a useful adjunct during multimodal postoperative pain management whether given before operation or perioperatively [5,6]. The time-limited effect of a single bolus administration of a local anaesthetic has been improved through continuous surgical wound infusion techniques using multi holed soaker type catheters, positioned by the surgeon at the end of procedure [4]. By allowing patients to mobilise more quickly, wound infiltration may be as effective as central and proximal peripheral blocks in ensuring a safe postoperative recovery. This modality can hence be extended to the large cystic removal or other oral and maxillofacial surgical procedures.

The following case report describes the management of a large periapical maxillary cyst by surgical enucleation, followed by catheterisation for local anaesthetic drug delivery to obtain successful postoperative analgesia.

2. Case Report

A 34-year old male patient reported to the department of Oral and Maxillofacial Surgery with chief complaint of pain and swelling for the last six months. Medical history was non contributory. Intraoral clinical examination revealed a round to oval swelling located over left palatal region in association with left maxillary incisor to second premolar region. On palpation the lesion was

approximately 3.5 x 5 cm, soft to firm in consistency and tender. The swelling was fluctuant on palpation which indicated a loss of integrity of palatal bone, buccally there was a localized swelling and sinus tract in relation to 13, the mucosa overlying the swelling exhibited a bluish tinge (Figure 1). The panoramic radiograph showed large periapical radiolucency about 4 cm in the horizontal plane and 3 cm in the vertical plane associated with teeth 21 and 25 (Figure 2). Vitality Tests were carried out (Heat / Cold & EPT) which elicited a negative response in relation to 11, 12 and 13. The treatment plan included root canal

therapy with respect to 11, 12 and 13. Surgical management of the cyst was planned which included cyst enucleation and apicectomy in relation to 11. Aspiration was performed with a sterile needle of 0.5 mm and 1 ml of dirty white turbid fluid was obtained. On the basis of history and clinical finding, a provisional diagnosis was considered and the cyst enucleation was planned under local anaesthesia. Medical history and investigations did not reveal anything that could oppose or influence the proposed treatment plan.



Figure 1. Palatal swelling Pre operative view



Figure 2. Pre operative radiograph showing the extent of periapical lesion in anterior maxilla

3. Endodontic Therapy

A multi visit endodontic therapy was planned with respect to 11, 12 & 13. Root canal preparation and obturation was carried out uneventfully in relation to 12 and 13. Obturation completed in relation to 11.

4. Surgical Phase

Assessment of the surgical site showed adequate mouth opening. Local anaesthesia of 2 % lignocaine with 1:200000 adrenaline was infiltrated in the greater palatine foramina and nasopalatine nerve were also anesthetized by infiltration in the incisive foramina.

The labial full thickness mucoperiosteal flap was elevated to expose the area of periapical lesion. Upon entry into the cystic cavity there was turbid white dirty fluid associated with cystic lesion. Lavage with sterile saline was performed. Already existing pathological cortical bone window was expanded until underlying pathology was adequately exposed and sufficient space was available for thorough curettage.

For surgical enucleation of the cyst, a buccal approach was adopted and a full thickness flap was raised. Cyst enucleation (Figure 3) was carried out, where the complete cyst walls were separated from the surrounding bony defect, with the intact removal of the cyst lining along with its contents; the cyst had a gross size of 3 by 5 cms, which was enucleated by making a bony window of a same size. The histopathology reported presence of

stratified squamous epithelium, interspersed with few ciliated cells, with loose connective tissue adjacent to the epithelial lining, with epithelial infiltration of numerous

polymorphonuclear cells, lymphocytes and few mast cells hence confirming the diagnosis of an infected radicular cyst.



Figure 3. Intra operative view of cyst enucleation and post enucleation defect



Figure 4. Spinal catheter to be inserted in defect site



Figure 5. Post operative view of surgical site with spinal catheter in situ

Following this, a spinal catheter (Figure 4) was inserted and fixed in place for the administration of local anaesthetic drug and the catheter was fixed to the adjacent mucosa using a 3 o silk suture (Mersilk, Ethicon, India), and the flap was closed using 3 o Polyglactin suture

(Vicryl, Ethicon, India) this administration of local anesthesia through the catheter could enhance the postoperative analgesia. (Figure 5) The catheter was kept for a period of 48 hours and removed. Uneventful post surgical healing took place.

5. Post-Operative Care

The suitable antibiotics (Cefixime and Clavulanate Potassium, Taxim-O CV 200 mg, twice daily, Alkem, India) and analgesics (Diclofenac Sodium 75 mg twice daily, Voveran, Novartis, India) for 5 days were prescribed, along with warm saline mouth bath 3 to 4 times daily for 2 weeks. The catheter was injected with 1 ml of 2 % Lignocaine Hydrochloride (Xylocaine 2 % plain, AstraZeneca, New South Wales) for pain relief every 4 hours for the first 24 hours and then 6 hours for the next 24 hours, following which the catheter was removed. Sutures were removed 1 week postoperatively. Patient was re-instructed for proper oral hygiene measures post-operatively and examined weekly up to 1 month after surgery and then 2 and 6 months.

6. Discussion

The periapical cyst is the most common odontogenic cyst (52.3-70.7 percent of all odontogenic cysts) followed by the dentigerous cyst (16.6-21.3 percent of all odontogenic cysts) and odontogenic keratocyst, or OKC (5.4-17.4 percent of all odontogenic cysts) [7]. The choice of treatment may be determined by some factor such as the extension of the lesion, relation with noble structures, evolution, origin, clinical characteristic of the lesion, cooperation and systemic condition of the patient [8]. The treatment of these cysts are still under discussion and many professionals opt for a conservative treatment by means of endodontic technique (Hoen, 1990; Rees, 1997). However, in large lesions the endodontic treatment alone is not efficient and it should be associated to a decompression or a marsupialization or even to enucleation (Neaverth; Burg, 1982; Hoen Et Al., 1990; Rees, 1997; Danin 1999). In this regard, it is suggested that the treatment of the apical periodontal cysts should be defined according to the clinical and x-ray evaluations according to each case [8,9].

Optimizing postoperative pain management can be challenging due to surgical factors (type of procedure, surgical approach, and length of surgery), intrinsic patient responses to surgery and pain, and the pharmacologic approaches taken. Multimodal use of adjuvant agents (e.g. local anaesthetics, non-steroidal anti-inflammatory drugs, ketamine, sympatholytics, steroids, and non-pharmacological techniques) which limit the requirements for opioid analgesics may prevent common postoperative side-effects such as ileus, and nausea and vomiting, thus enabling more patients to meet early discharge criteria [4].

Wound infiltration with local anaesthetics may provide pain control with the added benefit of increased wound perfusion and oxygenation enhancing wound healing [10]. One time bolus injections of local anaesthetics can provide narcotic-limiting pain relief for 4-8 h after operation. However, the duration of analgesia is brief and does not provide long-term benefits in terms of pain control or narcotic-limiting outcomes [4].

Local anaesthetics have become increasingly popular for management of surgical pain [11,12]. In addition to providing good analgesia, local anaesthetic wound infiltration is simple, safe and inexpensive [13]. The most feared complication of continuous wound infiltration is

the risk of wound infection caused by the catheter acting as a focus for contamination. This remains theoretical since there are no data from published studies to justify this fear. Furthermore, LAs have well documented bacteriostatic and bactericidal actions [14]. Of these, lidocaine and prilocaine are the most effective, racemic bupivacaine has greater efficacy than levobupivacaine and ropivacaine has no antimicrobial effect [15]. In contrast, bupivacaine showed profound chondrotoxic effects in an experimental intra-articular model [16].

In the presented case, the patient recovered faster and in a better way as the postoperative period was painless due to the continuous local anaesthetic drug delivery. This can be attempted in any major surgery involving oral and maxillofacial regions. Much work still needs to be done to elaborate on the appropriate dosage, time and type of the drug to be used in oral and maxillofacial surgeries.

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