INCIDENCE ETIOLOGY AND TREATMENT OF ALVEOLAR OSTEITIS

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ABSTRACT

Alveolar osteitis is the most common post operative sequel to tooth extraction. It occurs despite the most exacting operative technique, aseptic procedure and regardless of the ability of surgeons. Various packing materials are available for topical treatment of alveolar osteitis.

Purpose: The present study was conducted to evaluate and compare the effectiveness of Zinc Oxide Eugenol dressing, Alvogyl dressing and platelet rich fibrin dressing in the treatment of dry socket.

Materials: This study comprised 60 patients of dry socket in the span of 5 years. The patients were randomly divided into three groups on the basis of treatments: Group A (zinc oxide eugenol group), Group B (alvogyl group), and Group C (platelet rich fibrin group). The clinical progress was noted at 1st and 7th day of treatment.

Results: Socket healing was faster and better in group C than in group A and B but symptomatic pain relief was faster in group A and group B.

Conclusion: According to this study PRF might be a superior treatment of choice in the management of dry socket.

INTRODUCTION

Dry socket was first described by Crawford in 1896. Ever since many terms have been used as synonyms of dry sockets, alveolar osteitis, alveolitis, painful socket, sloughing socket, fibrinolytic osteitis, alveolitis sicca dolorosa, septic socket, necrotic socket, alveolalgia, localized osteomyelitis, post extraction osteomyelitic syndrome and fibrinolytic alveolitis (Archer, 1975). It can be defined as inflammation of the extraction socket occurring 1–4 days post operatively, characterised by intense throbbing pain accumulation of disintegrated clot and food debris in the socket and malodor (Sheikh et al., 2010). It is the most common complication following extraction, with a peak incidence in the 40–45 year-old age group (Noroozi et al., 2009). The incidence of dry socket ranges from 0.5–5% for all routine extractions, but can reach up to 5–30% for extractions of impacted mandibular third molar (Kolokythas et al., 2010; Fridrich et al., 1990). Alveolar osteitis is known to have a multifactorial origin. The onset of AO is typically around 2–4 days post-extraction. Blum explains how it is unlikely to occur before the first 24 hrs due to the presence of antiplasmin (plasmin inhibitor) which delays fibrinolysis; and it is only once levels of antiplasmin have been reduced that breakdown of the clot occurs (Blum, 2002). Its duration varies, but is speculated to range between 5 and 10 days.

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MATERIALS AND METHODS

This study comprised of 60 patients clinically diagnosed with dry socket reporting to our department, were divided into three groups using stratified random sampling method.

- **Group A** - 20 patients treated with zinc oxide eugenol dressing (ZOE)
- **Group B** - 20 patients treated with Alvogyl dressing
- **Group C** - 20 patients treated with platelet rich fibrin dressing (PRF)

Patient’s complaint and history of presenting illness, past medical, surgical history were recorded. Exclusion criteria were patients on steroid therapy, diabetes and pregnancy. In group A and group B patients after proper irrigation with normal saline, socket was dried gently and isolated using gauze followed by placement of a doughy mixture of ZOE and readily available Alvogyl dressing. Group C patients PRF dressing was placed and secured with figure of eight suture (Figure 1) under local anesthesia. Patients in all the three groups were advised to use chlorhexidine mouthwash and analgesics post treatment. Pain remission was analysed and compared with different treatments using visual analogue scale (VAS). Alveolar bone healing was observed by 3-7 days of treatment.

RESULTS

In this present study of 60 cases of dry socket, included 40 (66.66 %) males and 20 (33.33%) females (Table 2). Age range was 18-56 years and means (SD) was 36.31 (11.91) years. The incidence of dry socket was more prevalent in male (66.66%) and most of the patients were in third decade (36.31years) (Table 1).

Table 1. Age Distribution of Patients Studied

<table>
<thead>
<tr>
<th>Age distribution</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Mean age in years</td>
<td>34.55</td>
<td>38.8</td>
<td>35.6</td>
<td>36.31</td>
</tr>
<tr>
<td>SD</td>
<td>12.90</td>
<td>11.9</td>
<td>11.03</td>
<td>2.21</td>
</tr>
</tbody>
</table>

Table 2. Gender Distribution of Patients Studied

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of patients</th>
<th>ZOE group</th>
<th>Alvogyl group</th>
<th>PRF group</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>20</td>
<td>7</td>
<td>35</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>13</td>
<td>32.5</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>20</td>
<td>33.3</td>
<td>21</td>
<td>35</td>
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</tbody>
</table>

Table 3. Pain Remission after 24 hrs

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean (1st post OP)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOE</td>
<td>1.3</td>
<td>0.47</td>
</tr>
<tr>
<td>Alvogyl</td>
<td>3.6</td>
<td>0.94</td>
</tr>
<tr>
<td>PRF</td>
<td>5.1</td>
<td>1.11</td>
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Table 4. Pain remission after 7th day

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean (7th post OP pain)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOE</td>
<td>1.3</td>
<td>0.45</td>
</tr>
<tr>
<td>Alvogyl</td>
<td>1.55</td>
<td>0.58</td>
</tr>
<tr>
<td>PRF</td>
<td>1.2</td>
<td>0.4</td>
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</tbody>
</table>

Table 5. Healing of Alveolar Mucosa on 7 th day

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean (7th day healing)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOE</td>
<td>0.67</td>
<td>0.24</td>
</tr>
<tr>
<td>Alvogyl</td>
<td>0.9</td>
<td>0.3</td>
</tr>
<tr>
<td>PRF</td>
<td>2.17</td>
<td>0.23</td>
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Pain remission - Table 3 and 4 shows pain reduction is more rapid in ZOE group than Alvogyl group and PRF group on day
DISCUSSION

Management of Alveolar osteitis is directed primarily towards relief of the patient’s pain during the healing stages, which takes place by palliative means (Blum, 2002). The use of intra-alveolar dressing materials is widely suggested in the literature (Swanson, 1990; Vezeau, 2000; Mitchell, 1986), although it is generally acknowledged that dressings delay healing of the extraction socket (Schatz et al., 1987). Different medicaments and carrier systems are commercially available today with little scientific evidence about usage in management of dry socket (Alexander, 2000). Alvogyl (Septodont, Inc, Wilmington, DE) has been widely used in the management of AO and is frequently mentioned in the literature. Alvogyl contains but amben (anesthetic), eugenol (analgesic), and iodophorm (antimicrobial). Some authors (Syrjanen, 1979; Summers and Matz, 1976) have noted retardation of healing and inflammation when the sockets were packed with Alvogyl.

- Antibacterial dressing
- Obtundent dressing
- Topical anaesthetics dressing and
- Combination of above (Blum, 2002).

Various studies have shown mean age group of 35.2 years (Babatuande et al (Akinbami and Godspower, 2014), 40 – 45 years by (Rud et al., 1970), 20-40 years (MacGregor, Chalifour et al. 1968; Chalifour et al., 1969). In the present study, the mean age was reported to be 36.31 years which correlates with the other studies done in the past. In our study, a total of 40 (66.6%) male patient had dry socket. More male patients had dry socket than females; the cause may be due to the habit of smoking which also correlates with the previous studies. Sweet and Butler, 1979 found, in a study of 400 mandibular extractions, that the incidence of dry socket was substantially greater in smokers than in nonsmokers (6.4% vs. 1.4%, respectively).

According to 24 hours values from treatment initiation, zinc oxide eugenol group with a mean pain score of 1.3 (0.47) is significantly faster and effective in decreasing the intensity of pain when compared with algovyl with a score of 3.6 (0.94) and PRF with a highest score of 5.1 (1.11). On 7th day post treatment there was significant decrease in intensity of pain in PRF group with a mean of 1.2 (0.4) and algovyl group with a mean of 1.55 (0.58). The intensity of pain reduced in all three treatment groups by 7th post treatment day. Resolution of pain is comparable with the results other similar studies done in the past. Turner stated that packing of the socket could delay socket healing and increase the risk of an infection (Turner, 1982). Kaya et al in their study to compare the effectiveness of algovyl, salicept and low level laser therapy noted that algovyl achieved pain remission in third day (Kaya et al., 2011). Alveolar mucosal healing – In our study healing is faster and better in PRF group as compared to algovyl and ZOE group at the end of 7th post treatment day. ZOE group lagged behind in complete healing at 7th day. These findings are in accordance with Turner’s study, which stated that packing of the socket could delay socket healing and increase the risk of infection. Pal et al did a study to compare the zinc oxide eugenol dressing and plasma rich in growth factor (PRGF) with gelatin sponge in treatment of dry socket and concluded that symptomatic pain relief was faster in ZOE group, but healing is faster and better in PRF group as compared with the ZOE group (Pal et al., 2013). The rationale for using PRF was based on previous studies, which showed the potential of PRF in the process of bone healing. PRF contains platelets, plasma rich in growth factors and growth factors. Alpha granules of platelets include a high concentration of growth factors such as platelet derived growth factor (PGDF), tissue growth factor (TGF), platelet derived endothelial growth factor (PDEGF), platelet derived angiogenesis factor (PDAF), interstitial growth factor IGF-1, and platelet factors 4 (PF-4). These factors increase tissue vascularity through increased angiogenesis, chemotaxis of macrophages and fibroblasts, increased granulation tissue production and epithelialisation, enhanced osteogenesis. These might also act as antimicrobial effect. Recent reports have suggested that more rapid epithelialisation denser and mature bone with better organised trabeculae and greater bone regeneration occurs with PRF (Pal et al., 2013). Kaya et al stated in their study that alveolar mucosal healing is faster with the use of low level laser therapy (LLLT) and platelet rich growth factor (PRGF) (Kaya et al., 2011).

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES


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