



## Review Article

# A literature review on dry socket

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### ABSTRACT

Dry socket falls under the most common as well as serious complications, which usually encountered after the extraction of third molar. The occurrence of dry socket in dental clinical practice is very common, which may be due to systemic or chronic disease related to the patient health, that alters the patient immunity with respect to infection, there will be other local chances too for the occurrence of dry socket which include the habits of smoking cigarette, chewing pan masala, bad oral hygiene. This article reviews the main causes of dry socket, various treatment modalities for the same.

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## 1. Introduction

Dry socket is the most common complication due to surgical or traumatic removal of the tooth from the oral cavity. Dry socket is otherwise known as “Alveolar Osteitis”. This is one of the most common problem that is associated post operatively, which leads to the patient discomfort along with pain and this condition results in multiple post operative visits to the dental operatory.<sup>1,2</sup> The pain that occurs due to the dry socket usually occurs after one day to third day of the extraction, which may be due to disintegration of the blood clot.<sup>3</sup> This type of complication usually occurs during the traumatic extraction of maxillary or mandibular third molar.<sup>4</sup>

The chances of occurring of dry socket or alveolar osteitis in case of dental extractions that are occurring in routine is found to be 0.5% to 5%.<sup>5–7</sup> The chances of occurrence of dry socket or alveolar osteitis after the extraction of mandibular third molar varies from 1% to 37.5%.<sup>7,8</sup> Incidence of dry socket encountered ten percent

higher when extraction was done surgically rather than normally.<sup>9</sup> In most of the cases associated with alveolar osteitis or dry socket, pain start appearing between first to third day after the tooth is being extracted surgically or traumatically.<sup>10,11</sup> Other literature shows that most of the cases of dry socket or alveolar osteitis reports with in a week, which include 95% to 100% of the cases.<sup>11</sup>

Crawford in the year of 1896 first described the dry socket in the given literature.<sup>12</sup> Some other terminologies for dry socket are as: alveolar osteitis, alveolitis sicca dorosa, localized osteitis, localized alveolar osteitis, necrotic socket, alveolalgia. Dry socket can be defined as with the most recent definition as “post operative pain that is present inside and around the site of extraction, that increases in term of severity at any possible time between the first day and third day after the extraction is been done, along with disintegration of the blood clot from the extraction socket that too along with or without halitosis.<sup>13</sup> Different studies revealed that pain along with empty alveolus is found in most of the cases of dry socket.<sup>14–16</sup> Literature revealed that the pain from dry socket radiates usually and in most of the cases towards temporal and

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ear region and radiates less towards the frontal as well as towards the ocular region.<sup>14-16</sup>

## 2. Incidence

In day to day dental extraction practice the frequency or incidence of dry socket is found to be in the range of 0.5 percent to 5 percent.<sup>8-11</sup> On the other hand the frequency of dry socket or alveolar osteitis of mandibular third molar was found to be 1percent to 37.5 percent.<sup>8-11</sup> Literature revealed that surgical extraction that is done surgically or traumatically resulted in ten times higher incidence of dry socket.<sup>12</sup>

## 3. Pathogenesis

According to birn the basic etiology of dry socket is due to increase amount of fibrinolytics which ultimately leads to disintegration of the blood clot, which found to be a result of activation of plasmonigen pathway, that can be accomplished via direct i.e. physiological and indirect i.e. non physiological activator substances. As there occur any trauma to the alveolar bone itself, direct activators activated and released. On the other hand indirect activators are associated with the bacterial products and toxins created by the bacteria. It was found that the antiplasmins will result in the inactivation of active plasmins in the general circulation. Birm along with his team members did performed the study and revealed that there is higher fibrinolytic activity with respect to tissue of uterus and in the bone too, when compared to heart, brain, kidney.<sup>17-19</sup>

## 4. Risk Factors for Dry Socket

### 4.1. Traumatic extraction / surgical trauma

Many authors revealed that the occurrences of dry socket is most commonly due to trauma during extraction or during the surgical extraction, that might be due to activators liberation of direct tissue which found to be secondary to the inflammation of bone marrow.

### 4.2. Inexperience

Many studies stated that, dry socket can happen also as a result of in experience of the dentist. According to Larsen, the dentist who is in experienced may lead to more amount of trauma i.e. soft tissue trauma as well a trauma to the alveolar bone, that too especially in case of surgical extraction. Oginni et al. also revealed in there study that there is higher incidence of alveolar osteitis or dry socket, when the extraction is done by an in experienced dentist.<sup>15,20</sup>

### 4.3. Third molars

different studies revealed that the chances of alveolar osteitis is more during the extraction of mandibular third molars.<sup>18-20</sup> The reason behind this site specificity of dry socket is found to be by different authors is that there is increase amount of bone density in the mandibular third area region along with decreased vascularity along with reduced capacity in the formation of the granulation tissue.

### 4.4. Systemic disease

According to some researchers the incidence or occurrence of alveolar osteitis is might be linked up with the presence or absence of any systemic problem.<sup>15-18</sup> Conditions like hypertension, diabetes mellitus and others that alter the healing process, results in the formation of dry socket, due to defective or alter healing process.

#### 4.4.1. Medication

Medications like oral contraceptives results in the formation of dry socket. a study revealed that there is higher chances of formation of dry socket with respect to females that those are having oral contraceptives.<sup>21,22</sup> A study done by sweet and butler, revealed that there found to be having a passive co relation between intake of oral contraceptives and incidence of dry socket. That is due to estrogen that plays a major role in the process of fibrinolytic. It was found to be activating the fibrinolytic system that too indirectly. Another study done by cateneli et al revealed that incidence of alveolar osteitis can be increased by increasing the dose of estrogen, i.e. the dosage of estrogen is directly influencing the chances of occurrence of dry socket.<sup>23</sup>

### 4.5. Gender

Mcgreogor reported in there study that, regardless of taking oral contraceptives, females are more prone in development of alveolar osteitis, when compared to the male patient. He reported that 50 percent more chances or more incidence of development of alveolar osteitis in case of female patient rather than male patient.<sup>24</sup> On the other hand Colby in there study reported that, there found to be no difference in incidence as well as chances of occurrence of alveolar osteitis with respect to male and female gender.

### 4.6. Habits (Smoking)

Many studies revealed that, there is direct link between smoking cigarette and occurrence of alveolar osteitis. There is dose dependent inter relationship between smoking and the occurrence of alveolar osteitis.<sup>25</sup> According to study done by Colby et al.<sup>23</sup> the person who smoke half packet of smoke daily has a 3 to 5 time more chances of developing dry socket, when compared to the normal patient who do not smoke at all. According to blum this phenomenon of inter

relationship between smoking and occurrence of alveolar osteitis is due to introduction of foreign body that is nicotine that can hinder with the healing process at the extraction site and also results in disintegration of the blood clot.

#### 4.7. Clot dislodgement

Clot dislodgement in case of extraction mostly in the mandibular third molar region resulted in the occurrence of dry socket. Clot dislodgement can occur due to result of generated negative intra oral pressure due to sucking with the help of straw, smoking cigarette, local irritation at the extraction site, trauma after extraction, may lead to dislodgement of blood clot and finally resulted in the formation of dry socket with in 1 to 3 days after extraction.

#### 4.8. Infection

Infection from any cause, mostly bacterial infection shows higher chances of development of dry socket. Its been found that higher the chances of formation of alveolar osteitis with the patients those are having bad oral hygiene, along with local periodontal infection near the extraction site. *Streptococcus mutans* was found to be associated with occurrence of alveolar osteitis along with delayed healing at the extraction site.

#### 4.9. Curettage

If there is excessive curettage done at the extraction site along with excessive irrigation, that may hinder with the formation of blood clot and finally resulted in the formation of dry socket.

#### 4.10. Age

Literature suggested that age plays a major role in incidence of occurrence of alveolar osteitis. According to Blondeau et al, they stated that age is totally associated with incidence of alveolar osteitis. As old age people are more prone to chances of developing dry socket as compared to the younger group persons.

### 5. Prevention / Treatment Modality

The application of systemic antibiotics usually before the time of surgical extraction of third molars and as well as after the removal of third molar plays a major role in the prevention of alveolar osteitis. Antibiotics include clindamycin, penicillin, metronidazole plays a major role in the prevention of alveolar osteitis.<sup>26,27</sup>

Application of topical antibiotic paste is found to be effective in many studies, tetracycline is used as a local applied antibiotic in the form of gel, aqueous solution, powder or can be applied over the cotton swab and is found

to be very much effective in the prevention or as a treatment modality for dry socket.<sup>28,29</sup>

Many authors stated that the use of chlorhexidine in the concentration of 0.12 percent found to be very much effective when given prior to the surgical extraction starting from five days prior to the surgery as well as given peri operative, surely decreases the chances of occurrence of dry socket.<sup>25-29</sup>

Literature reported that, the application of PHBA i.e. para hydroxyl benzoic acid topically at the extraction site, surely decreases the chances of occurrence of dry socket. Para hydroxyl benzoic acid is an anti fibrinolytic agent and is commercially available in the market under trade name Aperyl. Another anti fibrinolytic agent name transxemic acid also plays an important role in the treatment of dry socket by reducing the pain of the dry socket, when applied topically in the extraction site.

A bio degradable ester along with clot supporting property named as PLA i.e. poly lactic acid when used topically in the extraction site, reduces the pain at the extraction site and promotes healing. A study done by Breke et al revealed that the use of poly lactic acid in the extraction site reducing the chances of occurrence of dry socket.

Corticosteroids was found to be very much effective in the decreasing the complications that occur after the extraction but found no role in preventing the incidence of occurrence of dry socket.

Dressing that contains eugenol, found to be very much effective in preventing the occurrence of alveolar osteitis. The use of intra operative lavage is also found to be very much effective in preventing the incidence of alveolar osteitis. The use of antiseptic agent named 9 aminoacridine found to be very much efficient in the prevention of dry socket.

### 6. Conclusion

Dry socket is one of the most common complication in day to day dental practice and is one of the unavoidable thing. One should know the risk factors for the same and try to avoid them in clinical practice. There are limited option as treatment modality for the same and more of it is directed towards proper prevention. Preventive methods include, one should avoid smoking, proper use of surgical instruments, less trauma to the soft tissue as well as to the bone, proper medication before and as well as after extraction reduces the chances of dry socket.

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### 8. Conflict of Interest

The authors declare that there is no conflict of interest.

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