

# Prevalence of Odontogenic Sinus Tracts among Dental Patients and its Oral Surgery Management at Bahawal Victoria Hospital & Quaid-e-Azam Medical College Bahawalpur

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## ABSTRACT

**Background:** It is an established fact, majority of the facial cutaneous discharging sinus and fistulas are of odontogenic origin, which result by the bacteriogenic process of the dental pulp necrosis. It may be sequence of dental caries, dental trauma or due to some local irritating factor of chemical which leads to teeth periapical infection.

**Aim:** To describe prevalence of odontogenic cutaneous sinus tracts, its clinical presentation and oral surgery management among dental patients attending dental outdoor at BV Hospital Bahawalpur

**Methods:** Hospital record base retrospective study from May 2012 to May 2016 at Dept of Oral & Dental Surgery BVH/QMC, Bahawalpur among outdoor patients with clinical history of cutaneous sinus/fistula confirmed with odontogenic origin with the help of dental periapical X-Rays or through panoramic radiographs with location of sinus tracts by gutta purcha points.

**Results:** There were total 48 patients enrolled in this study for the last two years from May 2014-16 with age range from 9 to 46 years with mean age 30 years. There were 17(35.41%) male and 31(64.58%) female most frequent site of the odontogenic cutaneous lesion was observed at mandibular sites at its angle 19(39.58%) and chin 11(22.91%) area. The mean time duration for patients referral was about 6 month with its range from 2.5 months to more than one year. The appropriate treatment as tooth extraction 30(62.5%), teeth restoration via root canal treatment 9(18.75%) followed by apicoectomy 05(10.41%)

**Conclusion:** Our study results put more emphasis on our counterpart medical professionals, for their better understanding of the differential diagnosis of such cutaneous lesions as they are the first to encounter them in our study setting. They need to be familiar with their odontogenic nature of origin for the early detection of such lesions, for the earliest possible referral and prompt interventions by the oral and dental professionals for patients better treatment planning, for better treatment outcome and prognosis to avoid any future complication.

**Keywords:** Odontogenic, Cutaneous Lesions, Sinus Fistula, Oral & Dental Patients, Outcome

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## INTRODUCTION

It is common practice among our routine outdoor patients presenting with history of cutaneous discharging sinus tract or fistula visiting our institution department dermatology, general surgery and ultimately referred to oral and dental surgery department to roll out the dental cause for such lesions.<sup>1</sup> It has been frequently observed that such type of the facial lesions are misdiagnosed starting from the general practitioner level to tertiary care hospital setting, at departments of skin as cutaneous infections to roll out underlying possibility of teeth periapical infections.<sup>2</sup> The main reason behind this misdiagnosis among different specialist treating

physicians is the presentation of these odontogenic lesions due to their presentation at some remote area from the site of origin in oral cavity with respect to teeth involved.<sup>3</sup> It has been reported that such patients are also referred for skin lesions biopsies by the general surgeons before consulting the oral and dental surgeon to confirm its odontogenic origin in our settings<sup>4</sup>.

The patients of odontogenic sinus tract lesions referred to department of oral and dental surgery usually have been tried on different regimens of the broad spectrum antibiotic cover along with anti-inflammatory drugs. These discharging sinus/fistula subside to some extent due to use of antibiotics but are not fully cured as the underlying pathology related to teeth root infection remain there as foci of infection<sup>5</sup>. The dental literature confirm the main aetiology of these cutaneous discharging sinus, as the chronic teeth periapical infection due to bacteriogenic process because of carious teeth,

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some chemical usually applied to teeth by dental quacks and mostly old history of trauma to teeth, which leads to pulp necrosis subsequently leading to teeth periapical infection. Another aspect of such lesions is the history of undiagnosed impacted teeth, which leads to chronic submandibular abscess as result of pericoronitis, which later on drains as cutaneous sinus tract on facial skin<sup>6</sup>.

The scientific literature review from oral pathology reveals such lesions to be sequence of teeth pulp necrosis due to bacterial invasion responsible for alveolar bone suppuration, localized abscess formation, which ultimately spreads in soft tissue space as drainage sinus and fistula<sup>7</sup>. The odontogenic nature of such lesions is carefully diagnosed at department of oral and dental surgery through routine intra oral periapical X-rays and the panoramic radiology by inserting a dental probe or gutta percha point from skin sinus tract to locate the radiolucent area of bone pathology to trace the teeth involved in periapical pathology for the cutaneous sinus tract<sup>8</sup>. It has also been documented the lesions of short duration heal up without any scar formation with prompt oral and dental treatment. The recommended treatment planning for the established and delayed lesions is preferably, the root canal treatment of the tooth involved along with apicoectomy of the bony pathology as the lesion being a sequence of pulp pathology<sup>9</sup>. The lesion with delayed history of diagnosis and radiological evidence of non restorable teeth, extraction of the teeth involved with necrosed soft tissue curettage to eradicate the sinus tract completely by oral surgeon under local anaesthesia to avoid its recurrence and any further chance of complication for better prognosis<sup>10</sup>.

## PATIENTS AND METHODS

This study has been conducted using hospital base cross sectional study design based on retrospective patients treatment record at Dept of Oral & Dental Surgery, Bahawal Victoria Hospital a tertiary care teaching institution attached the Quaid-e-Azam Medical College, Bahawalpur in Southern Punjab – Pakistan. The study subjects consists of our outdoor patients approaching dental OPD from May 2014 to May 2016 coming from the Bahawalpur periphery or referred to us from our institution own department of skin, general surgery, plastic surgery with history of cutaneous lesion discharging fistula confirmed on oral dental examination along with periapical X-Rays or through the panoramic view radiology by insertion dental probe or gutta purcha points from the skin orifice to locate the sinus/fistula tract. The study variables consists of the time lapse to approach for their treatment at our institution, study subjects age,

gender, area of residence, their socioeconomic status and educational status along with locations of the skin lesion and the tooth involved on radiological confirmation. Descriptive statistics regarding radiological findings along with the treatment planning procedure either restoration of the tooth involved by root canal treatment particularly the anterior teeth followed by apicoectomy or tooth extraction along with cutaneous lesion curettage were recorded with few patients follow up data along with history of scar healing and any prognosis in a semi structured questionnaire/proforma and the statistical analysis was carried out on SPSS 20.

## RESULTS

We have examined total 48 cases of such odontogenic cutaneous lesion in two years, whose age ranges from 9 to 46 years with gender determination 17(35.41%) male and 31(64.58%) female, hence male to female ratio was calculated at 1:1.8 from our study with statistically significance of female dominance. With respect to site of the cutaneous lesions, most of them were observed on the submandibular region either on the chin 19(39.58%) (symphysis menti) and 11(22.91%) submental region (para-symphysis) region, while 9(18.75%) at the maxillary anterior teeth with history of trauma. The mean duration of the cutaneous lesion diagnosis was more than 6 months and its range of duration was 2.5-3 months to more than one year (Table 1).

Table 1: Demographic characteristics of patients with odontogenic cutaneous lesions

Demographic information	No.	%
<b>Gender</b>		
Male	17	35.41
Female	31	64.59
<b>Area of residence</b>		
Urban	13	27.08
Rural	17	35.41
Slum area	18	37.50
<b>Socioeconomic status</b>		
Lower middle class	23	47.91
Middle class	17	35.41
Upper middle class	7	14.58
Well off	5	10.41
<b>Patients education level</b>		
Primary/informal level	20	41.66
Middle to Matric level	17	35.41
Inter level	9	18.75
Graduate	2	4.16
<b>History of dental treatment</b>		
Quake/chemist	11	22.91
Dental filling by quack	26	54.16
History of medication only	7	14.58
By dental surgeon (qualified)	4	8.33

It is quite evident that the mandibular regions was most involved 36(75%) in such type of the sinus fistula as compared to maxillary region 12(25%) the ratio comes out to be 3:1 from our study results. Similarly, 1<sup>st</sup> mandibular molar tooth was the most frequent tooth to be involved in as main cause of odontogenic cutaneous sinus 16(33.33%) followed by the mandibular incisors teeth 12(25%). The maxillary incisors were responsible for 9(18.75%) times and among young adult patients the mandibular 3<sup>rd</sup> molar tooth involving angle of the mandible was also involved in 6(12.5%) of cases from our study data set, while the rest of the lesions were among the relatively younger age group children from rural population mainly due to primary molar teeth involvement 5(10.41%) [Table 2].

Table 2: Frequency and percentage of odontogenic cutaneous lesions

Cutaneous lesion	No.	%
<b>Gender</b>		
Maxillary region	12	25.0
Mandibular region	36	75.0
<b>Site of the lesions</b>		
Submandibular region (Chin)	19	39.58
Submental region	11	22.91
Maxillary anterior region	9	18.75
3 <sup>rd</sup> molar teeth area	6	12.50
Other sites (infraorbital)	3	6.25
<b>Involvement of the tooth</b>		
Mandibular 1 <sup>st</sup> molar	16	33.33
Mandibular incisors	12	25.0
Maxillary incisor teeth	6	18.75
Mandibular 3 <sup>rd</sup> molar area	6	12.5
Mandibular primary molars	5	10.41
<b>Clinical history of aetiology</b>		
History of Dental Caries	29	60.41
Old history of trauma	19	39.59
<b>History of 1<sup>st</sup> consultation</b>		
Medical Doctor/GPs	15	31.25
Skin specialist	13	27.08
Quack/Chemist	11	22.91
Dentist	9	18.75

The most frequent treatment option carried out was extraction of the teeth involved 30(62.5%) due to time lapse as majority of the patients consulted us after more than six months after the onset of signs and symptoms presenting as discharging sinus/fistula. Although in 9 cases endodontic (root canal treatment) has been carried out 9(18.75%) at our department of oral & dental surgery followed by apicoectomy of the lesions in 5(10.41%) and among 4 such lesions after tracing the fistula tract, its soft tissue curettage was done 4(8.33%) under local anaesthesia as well. There was history of recurrence in 7 cases after about one year follow up 7(14.58%), while there was

good prognosis of 41(85.41%) overall in our study. It was noticed that most of these patients belong to rural or city slum areas with low education level and relatively less access to healthcare facilities so their pattern of consultation was with their medical general practitioner in their local area or at the most to a skin specialist at our tertiary care level hospital who refer them to our dental outdoor to be diagnosed and treated as an odontogenic lesion at department of oral and dental surgery as given in table 3.

Table 3: Odontogenic lesions history of treatment

Cutaneous lesions treatment option	No.	%
<b>Treatment options carried out</b>		
Extraction of tooth involved	30	62.5
Endodontic treatment of tooth involved	9	18.75
Endodontic plus apicoectomy tooth involved	5	10.41
Extraction plus soft tissues curettage	4	8.33
<b>History of patients duration for last dental care visit</b>		
Within last 2-3 months	5	10.41
Within last 4-6 months	7	14.58
Within last 7-9 months	13	27.08
Within last 10-12 months	17	35.41
More than last 12 months	6	12.5
<b>History of Morphology of lesion presentation</b>		
Nodular form	8	16.66
Abscess form	13	27.08
Sinus/fistula form	18	37.5
Ulcer (Not healing)	9	18.75
<b>History of lesions prognosis</b>		
Good, no recurrence notice in follow up	41	85.41
Poor, recurrence notice in follow up	7	14.59
<b>History of patients referral from</b>		
General Surgeon/GPs	14	29.16
Skin Specialist	13	27.08
Quack/chemist	9	18.75
Dentist from periphery	12	25.0

## DISCUSSION

Prevalence of odontogenic cutaneous lesions is relatively common among adult population with low socioeconomic status, majority from the rural areas or urban slums with low education level and awareness along with lack of accessibility to appropriate oral and dental healthcare facilities in our settings.<sup>11</sup> The intra-oral sinuses of dental origin are very easily identified by the patients themselves and also diagnosed by dentists on oral examination, but the cutaneous lesions with dental etiology and pathology usually are misdiagnosed by the general medical practitioners, general surgeons and skin specialists due its presentation on the facial extraoral discharge, relatively at distinct place due to muscle

planes and less developed alveolar cortical plates breakthrough because of dental infection.<sup>12</sup> Dental literature search reveals the history of misdiagnosis of such discharging cutaneous fistulas with its primary link to dental cause among children and adolescent with mean age 30 years and predominantly female gender more affected from various parts of world, this finding is in consistent with our study results as well<sup>13,14</sup>.

It is quite evident the site of the cutaneous sinus tract is usually in close association to the origin of the tooth involved and from the results of our study data set, the most common site as the submandibular region followed by the chin in relatively younger age group<sup>10,15</sup>. It is recommended that a very careful intra-oral and extra-oral examination of the lesions should be performed along with dental periapical or panoramic radiology tools to rollout dental cause through differential diagnosis clinically and if required histopathologically<sup>14,16</sup>. Sometimes, when it difficult to pinpoint the dental cause, when the cutaneous lesion is relatively far from its site of origin, dental/lacrimal probe or use of dental root filling material called gutta purcha is used to trace the sinus fistula tract along with panoramic dental radiographs by inserting these tools from the skin orifice to locate the sinus tract most appropriately with the help of recently availability software in use for dental surgery settings<sup>17</sup>.

The most common cause is the dental caries and old history of trauma particularly among young children and adolescents as pointed out from the results of our study<sup>3,7</sup> while on the other hand among adults, mandibular first molar tooth came out to be the most commonly involved tooth in the aetiology of these lesions, this finding is in contrary to the finding of the mandibular and maxillary incisors teeth which are most commonly involved in history of physical and support trauma in our rural and urban areas<sup>18</sup>. It has also been observed that in our rural and slum area setting, hand water pump is most commonly used to fetch water and from our study data set, some of study participants also reported the accidental trauma by this hand water pump as well<sup>18,19</sup>. Due to lack of access to proper oral and dental healthcare faculties and sometimes lack of affordability has also been determined the main cause and aetiology for time lapse to seek appropriate dental treatment well in time<sup>20</sup>.

The dental treatment for such traumatic teeth is relatively costly with respect to socioeconomic condition of the general population to afford root canal treatment followed by apicoectomy and then crowning later on, due to this reasons, there is history of recurrent tooth periapical infection, which ultimately leads to chronic discharging sinus or

fistula. There is usually delay from patients side to seek proper dental treatment at government healthcare facilities and lack of awareness as well.<sup>21</sup> The scientific dental literature search reveals that the treatment of such discharging cutaneous lesion of dental origin as root canal treatment to restore the tooth involved. It is sequence of pulp pathology either because of dental caries or pulpal trauma, in case of shorter duration of history of illness; it will heal up automatically without any periapical lesion and no scare formation. In case of the periapical pathosis, there should be proper root canal treatment followed by apicoectomy with further follow up to look for treatment better prognosis for patient cosmetic reasons<sup>22</sup>.

## CONCLUSION

The odontogenic discharging cutaneous tracts have always been misdiagnosed by the general medical practitioners, general surgeons and the skin specialists who usually first come across with these lesions among the general population in our setting. As without treating the under lying oral and dental cause, it not only adds to patients suffering but also further deteriorate the patients condition which is sometimes even self healing, when intervene well in time by the dentists. The stake holder for oral and dental healthcare delivery need to play their roll in this regards to put forward suggestion for awareness among the socioeconomically underprivileged segment of our general population who are main sufferer for such lesions. At the same time professional and moral obligation of the medical, surgical and skin specialists to handle carefully such facial cutaneous lesions to rollout oral and dental cause in collaboration with the oral and dental surgeons for patients welfare at large.

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