

Association of History of Tooth Extraction and Carcinoma of Alveolus as Well as Gingiva

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Received: July 31, 2017; **Published:** September 07, 2017

Abstract

Oral cancers are one of the most widely occurring cancers. Late detection of oral cancer is one of the primary cause for sky scraping numbers of patients affected with this entity and mortality rates associated with it. Among the various sites of oral neoplasms, carcinoma of the alveolus is a relatively common intraoral neoplasm, but unlike tumors elsewhere in the mouth, pain is frequently an early presenting feature. Cases of carcinoma of the gingiva emerging following extraction of a tooth can be seen very often. In some situations, after extraction of a tooth, the carcinoma appears to develop very fast and proliferates out of the socket. This is probably due to the unhindered growth of the neoplastic tissue along the periodontal ligament and then sudden proliferation after extraction. It is believed that traumatic procedures hasten the malignant spread. In the present study, the emphasis is on early diagnosis and correct treatment planning which can affect the prognosis. Apart from that it will also help to improve the clinical awareness following tooth extraction.

Keywords: *Tooth Extraction; Unhealed Socket; Carcinoma of Alveolus; Tooth Mobility*

Introduction

In India oral cancer is one of the broad-spectrum cancers and it constitutes a major health problem [1]. Late detection of oral cancer is the primary cause that both the incidence and mortality rates of oral cancer continue to increase. Among the various sites of oral neoplasms, carcinoma of the alveolus is a relatively common intraoral neoplasm, but unlike tumors elsewhere in the mouth, pain is frequently an early presenting feature.

Occasionally, cases of carcinoma of the gingiva appear to arise following extraction of a tooth. In some instances, after extraction of a tooth, the carcinoma appears to develop rapidly and proliferate out of the socket, which could probably be due to the unobstructed growth of the neoplastic tissue along the periodontal ligament and then sudden proliferation after extraction [2]. However, if such cases are carefully examined, it can usually be ascertained that the tooth was extracted because of gingival lesion or disease or mobility which in fact was a tumor, which at the time of treatment went unrecognized or undiagnosed. This leads to delay in the final diagnosis being made and subsequently late detection of the tumor leading to greater morbidity, more intricate treatment. Previous data suggests that risk of gingival SCC recurrence, cervical lymph node metastasis are increased in patients with history of tooth extraction [3]. Usually gingival carcinoma is diagnosed late, following invasive procedures such as extraction or curettage [4]. Apart from that poor oral hygiene is one of the etiological factors for occurrence of squamous cell carcinoma which need to be paid attention [5].

There is paucity of literature, reporting on the patients undergoing tooth extraction followed by occurrence of tumor at the extraction site. These studies are crucial in order to document the association of occurrence of tumor followed by extraction at the same site and other related risk factors. Strategies to overcome the present situation must be undertaken by oral health programs for the early diagnosis, prevention and management as well as follow up of oral cancer.

Materials and Methods

Ethics

Informed consent of all the patients was recorded before their participation in the study.

The study was carried out with the following objectives and method:

Primary Objective

To find out the association of history of tooth extraction in patients with carcinoma of alveolus and gingiva in maxilla and mandible.

Secondary Objectives

1. To assess oral hygiene status in this group of patients.
2. To find association of habits with occurrence of cancer.
3. To assess duration of unhealed extraction wound for early detection of malignancy.
4. To identify the need for clinical awareness following dental extraction.
5. Site of placement of quid and occurrence of lesion.

Study Design

The protocol was reviewed and approved by an appropriate Institutional Review Board and that informed consent was obtained. All patients diagnosed with oral cancer attending the Department of Dental- Prosthetic Surgery and Oncology (Tata Memorial Hospital, Mumbai) were screened. Patients were assessed for history of tooth extraction followed by detection of tumor at the extraction site. Informed consents were obtained and their records were reviewed for demographic details, medical history, reasons for dental extraction, nature of extraction, time interval between tooth extraction and doubt of any major problem, post extraction signs and symptoms, duration of unhealed socket, nature of habits, investigations prior to extraction, treatment done for post extraction problem, biopsy report, oral hygiene status, tumor site, TNM classification (in accordance with the UICC) and tumor stage.

Statistical Analysis

Demographic, clinical and disease related continuous variables were computed for each subject and presented as mean (S.D) or frequency (% age). Categorical variables were analyzed using Chi-square test or Fisher's exact test. To assess the association between incidence of oral cancer with habits, demographic and disease-related variables were compared with Pearson correlation or Cramer's V correlation as per the type of variable. Regression analysis was used to identify demographic, habits and disease-related variables which can affect incidence of oral cancer. P-value < 0.05 was considered statistically significant.

Inclusion Criteria

Patients diagnosed with carcinoma of the alveolus and gingiva of maxilla and mandible with history of extraction in past few months with unhealed extraction socket were included in the study. Patients with previous history of malignancy were excluded.

Results

Amongst 8252 oral cancer patients visited to dental department 2087 were diagnosed with carcinoma of alveolus and gingiva. Out of 2087 patients with carcinoma of alveolus and gingiva in maxilla and mandible screened, 200 (9.6%) patients were associated with history

of dental extraction with chief complaint of unhealed extraction wound. Demographic and clinical details of these 200 patients were as given below.

Out of 200 patients 168 (84%) were male and 32 (16%) were female patients with age range 22 to 79 years and median age was 53 years. Amongst 165 (82.5%) patients were employed whereas 35 (17.5%) were unemployed. 167 (83.5%) patients were literate and 33 (16.5%) patients were illiterate. Only 36 (18%) patients had H/O Diabetes, hypertension and other diseases, 164 (82%) patients had no relevant medical history. 113 (56.5%) patients underwent extraction of mobile teeth without any investigations only 87 (43.5%) were advised other investigations like CT scan, OPG or intra oral radiograph.

Oral Hygiene and DMF Index

OHIS index and DMF index was used to assess oral hygiene status. Out of the 200, 136 patients (68%) had OHIS index score in the range of 3 to 4 (fair), 37 patients (18.5%) had OHIS score in the range of 5 - 6 (Bad) and 26 patients (13%) had OHIS score in the range of 0 - 2 (Good).

DMF score of 2 was found 33 (17.5%) patients followed by score of 4 in 22 (11%), and 6 in 19 (9.5%) of patients. DMF score of 5,7,8,9 was found in 60 (30%) of patients. Rest of the patients had DMF score of more than 10.

Assessment of duration of unhealed extraction wound for early detection of malignancy

168 patients (89%) reported with history of unhealed extraction as the first sign. Mean duration of unhealed wound after extraction was 2 - 6 months as reported by 126 patients (63%).

14 patients (7%) did not have any of the above symptoms but they were diagnosed with tumor at the extraction site. Pain was the most common first symptom in 162 patients (81%).

Identify the need for clinical awareness following dental extraction

141 (70.5%) patients underwent extraction for mobility of teeth. 35 (17.5%) of the patients had extraction done where the primary reason was dental pain and discomfort though no apparent dental cause (caries/periodontal) was reported. Extraction of teeth due to decay was minimal i.e. 4 (2%). 21 (10.5%) of the patient underwent removal of teeth to prevent trauma to tongue and cheek.

179 (89.5%) patients reported initially to the dentist after extraction due to various complaints. 142 (71%) of the intraoral suspicious lesions were reported by clinicians and 56 (28%) by patients themselves. 164 (82%) were referred for oncology opinion and to tertiary oncology care centre.

94 (47%) were referred to Tata Memorial Hospital in the first two months post extraction 106 (53%) were referred after 2 months for the treatment. 63 (31.5%) patients had the lesion at stage IV, 58 (29%) were at stage III, 51 (25.5%) were at stage II and 28 (14%) had stage I lesion. This shows that still there is tremendous need of clinical awareness so that malignancy can be detected at an early stage.

Site of placement of quid and occurrence of lesion

116 (58%) patients had developed lesion in the proximity of to the site of placement of the quid/tobacco. 60 (30%) patients had no co-relation with the site of placement of the quid and occurrence of lesion. 23 (11.5%) patients had lesion contra lateral to the site of placement of the quid. In this group of patients only 28 (14%) reported early.

By using chi square test it was found that there was association between location of quid placement and site of tumor ($p = 0.001$). Using Logistic regression analysis it was found that odds ratio for location of quid and site of tumor = 20.008 ($p = 0.001$). Thus indicating more chances of occurrence of tumor at site of placement of quid.

Discussion

The basic thought behind conducting this study was to assess whether invasive procedures, such as tooth extraction carried out affect the diagnosis of malignancy and the treatment outcome. Previously few studies were conducted and different findings were experienced by the investigators. In a study by Hong (2001), it was found that tumor related with previous dental extraction or curettage tends to be more extensive than what was predicted from an imaging point of view. The hypothesis that history of previous extraction worsens prognosis was suggested by Peterson (1993), and neck node metastasis was more commonly found in patients who underwent extraction (Suzuki, 1998). Few studies have shown that patients who underwent invasive procedures showed higher rate of primary tumor bone invasion as compared to the control group, in contrast with Suzuki's conclusion (1998) that T stage was not influenced by previous extraction. It has been suggested that spreading out of cancer cells into the circulation during invasive procedures could increase the risks of distant metastases (Kusukawa, *et al.* 2000). However, the association between survival and history of previous extraction remains controversial.

In the present study about 9.6% patients were associated with history of tooth extraction before diagnosis of carcinoma of alveolus and gingiva. Only 13% patients had OHIS scores in the range of 0 - 2 i.e. good, which signifies that lack of oral hygiene may contribute for oral cancer. 77.5% patients had habit of tobacco consumption in various forms and other added components, which is the most common etiology of oral cancer. 70.5% patients underwent extraction due to chief complaint of mobility of tooth. Mean duration of unhealed socket after extraction was 2 - 6 months for 63% patients, suggesting the need of clinical awareness following tooth extraction. In the present study it was also found that higher chances of occurrence of tumor at site of placement of quid rather than on the contra lateral site.

Conclusion

Gingival cancer in the region of tooth can imitate clinical and radiographic features of periodontitis similar to chronic inflammation which sets hurdles to make the diagnosis of gingival squamous cell carcinoma. Apart from that some studies have shown that chronic inflammation may be the probable cause for cancer. Presence pathology in the alveolus or gingival may be suspected if the tooth socket doesn't heal even after tooth extraction has been carried out to resolve the symptoms. In such situations emphasis should be given for the need of clinical awareness following tooth extraction. If the tooth socket doesn't heal within a period of month it is better to advocate a biopsy of the unhealed extraction socket.

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Volume 14 Issue 1 September 2017

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