Fractured Genial Tubercles Displaced to Mid-Floor of Mouth: A Rare Case Report

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INTRODUCTION

Genial tubercles are small bony tubercles, which give attachment to two extrinsic muscle fibers of the tongue, geniglossus and geniohyoid. In the case of trauma, these fractured segments are usually displaced to the floor of the mouth due to this muscle attachment. Although the genial tubercle fracture does not cause severe functional problems, it may present with pain, swelling and hematoma of floor of the mouth. Spontaneous or stress fractures of genial tubercles of atrophic edentulous mandible are mostly reported in the literature while trauma related fractures and displacement of the segment to floor of the mouth are a rare entity.1,2 Most of the cases are treated conservatively and seldom surgically.

CASE REPORT

A 54-year-old male patient was referred to department of oral and maxillofacial surgery with a chief complaint of pain in the lower jaw and restricted mouth opening following accidental hit with an iron rod on the face while working in a lathe. He was conscious and fully oriented with full Glasgow coma scale score, on presentation. There was a diffuse swelling in relation to lower face with soft tissue lacerations in the chin region. His mouth opening and mandibular movements were restricted and painful. Intraorally right and left lower central incisors were missing, and occlusion was deranged. A step defect in the anterior symphysis region with bone loss in the lower border of mandible was present on palpation. Panoramic radiograph showed a right subcondylar fracture with medial displacement, and occlusal mandibular radiograph revealed a step defect in the anterior region along with a triangular radio opaque shadow of approximate dimension of 4 cm × 3 cm × 3 cm in the middle part of floor of the mouth (Figure 1).

For further investigation computed tomography was taken, which showed a radio opaque segment displaced from symphysis region and lying almost 3 cm away, into the floor of the mouth.

We planned for surgical exploration of floor of the mouth, for retrieval and fixation of fractured genial tubercles segment, as the patient had functional difficulty in speech, mouth opening and deglutition. Entry to the surgical site was made through the lacerated wound in the chin. Surgical exploration could retrieve a triangular shaped displaced fractured segment (Figure 2), which was fixed to the lower part of symphysis region by means of titanium rigid fixation plates and screws (Figure 3). Wound was closed in layers, and post surgically healing was uneventful. Follow-up at 3 months showed complete symptomatic recovery and improved function.
Manoj, et al.: Displaced genial tubercle segment

in the midway between the superior and inferior border of mandible. Sometimes they may become prominent due to calcification of the tendinous insertion of the genioglossus muscle, which was described by Carroll et al. as “dystrophic calcification of the genioglossus ligament.”

Fracture of this segment in symphysis fractures is a rare occurrence, which may be due to trauma or stress. Stress or a spontaneous fracture of tubercles is more commonly seen in the edentulous mandible, due to abnormal stress loading following unusual muscle activity. In the absence of other pathologies or trauma, osteoporosis may be considered as a possible underlying cause, especially in the elderly population.

The upper and lower mental spines provide attachment to the genioglossus and geniohyoid muscles, respectively. Actions of these muscles are associated with two important vital functions – speech and deglutition. Genioglossus muscle aids in protrusion and raising the tip of the tongue, facilitating the buccal phase of deglutition, thereby guiding the food bolus to the pharynx. It also helps in the pharyngeal phase by forming Winslow’s geniopharyngeous muscle along with pharyngoglossus muscle. Both these extrinsic muscles of the tongue push the food bolus through the pharynx. Geniohyoid aids in laryngeal closure as it lowers the epiglottis by its action on the hyoideus.

Most cases of the genial tubercle fracture, reported in the literature, are of spontaneous type, in atrophic mandible, whereas in our case, it is trauma related. Anyway, the clinical signs and symptoms remain the same for both. A wide spectrum of manifestations like pain, swelling, hematoma in the floor of the mouth, limited tongue mobility and dysphagia may be seen, owing to its site of origin of genioglossus muscle. However these fractures are rarely life threatening because the tongue fall back is usually prevented by protrusive movement, in spite of detachment of the genioglossus muscle from symphysis region. Maw and Lindsay have postulated different hypotheses for abolishment of tongue fall back due to muscle detachment, (1) Intrinsic muscles can be trained to alter the shape of the tongue which aids in protrusion, (2) the palatoglossus muscle can aid in raising and protrusion of tongue, (3) the muscle fibers of the genioglossus forms an attachment to the anterior floor of mouth following detachment from mandible. Sometimes associated hematoma may cause obstruction of the airway in severe cases.

Panoramic radiographs may be taken to see the displaced genial tubercle, but superimposition of structures and fractured tubercle demineralization may sometimes make this an inadequate tool. An occlusal mandibular
radiograph clearly shows the displaced segment in relation to symphysis region. Computed tomography may aid in analyzing the extent of displacement of the fractured segment to the floor of the mouth. The floor of the mouth is a site for many pathologies, and this may cause a diagnostic dilemma for fractured genial tubercles, which may sometimes mimic a sialolith, hematoma, etc. The fractured bony segment may remain as a chronic irritation to the floor of the mouth, which may result in a malignant neoplasm.

The treatment of fractured genial tubercle is controversial as most authors have advocated a conservative management for asymptomatic cases, as literature review shows no major functional deficit associated with this fracture. But we had to intervene surgically as our patient had functional deficits like difficulty in speech, deglutition and tongue movements. Although the displaced muscles in these fractures are usually synergistic with other muscle groups for tongue movement, proper repositioning of these muscle fascicles is necessary to alleviate certain degree of discomfort and functional deficit associated with it.

CONCLUSION

In short, fracture of genial tubercle and its displacement to floor of mouth is a rare entity. Proper diagnosis and intervention are required to reduce the burden of functional and aesthetic problems, which the patient may encounter in these situations.

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REFERENCES