

Rare Enlargement of Genial Tubercles and its Management: A Case Report

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ABSTRACT

Genial tubercles are tiny bony projections located bilaterally around the lingual foramen, on the lingual surface of the mandible giving attachment to geniohyoid inferiorly & genioglossus superiorly. Due to delayed prosthetic rehabilitation & lack of balanced mastication excessive resorption of alveolar processes take place thereby leaving genial tubercles as elevated bony projections. This may pose problems in speech, deglutition & prosthetic rehabilitation. Excessive mobility of tongue may also contribute to enlargement of genial tubercles to such an extent that they may extend beyond the crest of alveolar ridges leaving them vulnerable to spontaneous fracture. This report presents a rare case of excessive enlargement of genial tubercles and its surgical management using a novel technique. This technique not only addresses the removal of the enlarged genial tubercles but also aims at reattachment of muscles attached to these tubercles, in a simple non morbid manner.

Keywords: Genioglossus, Mandibular exostosis, Mandibular swellings

CASE REPORT

A 78-year-old, completely edentulous male patient reported to the Department of Oral & Maxillofacial Surgery with the chief complaint of discomfort while eating. The patient was a denture wearer since 10 years and had discontinued wearing denture because of recurrent ulceration of the lingual mucosa caused by the denture. There were no underlying systemic medical problems and no history of any adverse habits was elicited. Upon inspection, the lingual mucosa in the floor of the mouth was raised above the crest of the mandibular alveolar ridge suggesting underlying bony pathology [Table/Fig-1].

Surface inflammation of the overlying mucosa in the same region was also evident, probably the cause of discomfort to the patient. On palpation, a bony prominence was felt on lingual surface of mandible in the midline and a differential diagnosis of enlarged genial tubercles, mandibular tori, osteoma, and mandibular sialolith was made. Sialolith was ruled out owing to the anterior location and non movable nature of the swelling. In lieu of the differential diagnosis cited, patient was advised to get a computed tomogram done. Computed tomographic scan revealed 11mm wide and

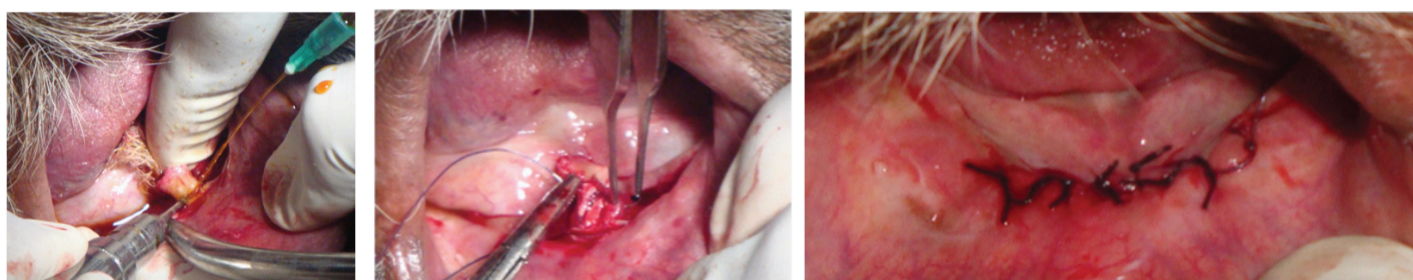
21mm long genial tubercles extending about 15mm beyond the crest of residual mandibular ridge [Table/Fig-2].

Patient was well informed about the condition, its implication and its treatment. Written consent was obtained and surgical removal of genial tubercle was planned under local anaesthesia and aseptic conditions. An incision was placed on the crest of the mandibular ridge & a full thickness mucoperiosteal flap was raised lingually [Table/Fig-3]. Tendons of genioglossus muscle were visualized. The tendons were tagged with 3-0 vicryl suture for later inferior repositioning of the muscles [Table/Fig-4].

The base of genial tubercle was sectioned using straight bur (Straight fissure surgical bur no. 702) & was smoothed using round bur no. 050 (Diameter 5mm) under copious irrigation [Table/Fig-5]. After complete removal of bony tubercle, tendons were inferiorly attached to the periosteum at base of the alveolar ridge so as to avoid inadvertent fall back of the tongue [Table/Fig-6]. The site was sutured using 3-0 black braided silk suture using simple interrupted technique [Table/Fig-7]. The mobility of tongue and the depth of labial vestibule were checked for adequacy to facilitate fabrication of complete denture prosthesis at a later



[Table/Fig-1]: Preoperative intraoral photograph showing mucosal elevation in the floor of the mouth **[Table/Fig-2]:** Three-Dimensional CT scan revealing enlarged genial tubercles **[Table/Fig-3]:** Surgical exposure of enlarged genial tubercles **[Table/Fig-4]:** Genioglossus muscle identified and tagged



[Table/Fig-5]: Genial tubercle being excised surgically **[Table/Fig-6]:** Genioglossus muscle reattached with inferior positioning **[Table/Fig-7]:** Postoperative photograph

stage. The patient was recalled for suture removal after 1 week [Table/Fig-8] and was referred to department of Prosthodontics after another 2 weeks for fabrication of complete denture which was delivered to the patient [Table/Fig-9].



[Table/Fig-8]: Postoperative photograph after 1 week

[Table/Fig-9]: Postoperative photograph after delivering complete denture

DISCUSSION

The genial tubercles are a group of four bony extensions that surround the lingual foramen bilaterally on the lingual surface of the mandible, situated midway between the superior and inferior borders of the mandible [1,2]. They act as the insertion for the geniohyoid muscles (lower genial tubercles) and genioglossus muscles (upper genial tubercles) [3]. The action of these muscles is associated with two important vital functions- speech and deglutition. Genioglossus muscles helps in tongue protrusion and elevation of its tip thereby completing buccal phase of deglutition. It also contributes in pharyngeal phase by forming Winslow's geniopharyngeous muscle along with pharyngeoglossus muscle [3]. Both these muscles of tongue help in pushing the food towards the pharynx during deglutition. Geniohyoid aids in laryngeal closure as it lowers the epiglottis by its influence on hyoid bone [4]. In some cases, these insertions or the presence of pronounced genial tubercles may cause recurrent ulceration of overlying mucosa and/or impede the use of prosthetic devices [4-6].

Complications related to presence of enlarged genial tubercles such as spontaneous fracture and displacement are cited in literature [1,3,5-8]. Occasionally patient may present with excessive resorption of alveolar process, because of which genial tubercles may become pronounced to such an extent that it may be mistaken for a swelling. These situations may pose problems in normal speech, mastication, deglutition and further rehabilitation with complete denture prosthesis.

In the literature, certain cases can be found where enlargement of genial tubercles and mandibular bone resorption were responsible for poor adaptation of the prosthesis, painful swelling, ulceration, haematoma in the floor of mouth, limited tongue mobility and dysphagia [4]. Additionally, enlarged tubercles can fracture owing to constant pull of genioglossus & geniohyoid muscles. The enlarged genial tubercles and/or calcified insertions should be surgically corrected.

The extent of enlargement of the tubercles to such a level is not a common occurrence. In this particular case not only the surgical

removal of enlarged tubercles has been done but also transposition and reattachment of genioglossus has been successfully performed. Both these facts make this case report a unique one.

There have been contrasting evidences in literature regarding need for reattachment of muscles following removal of genial tubercles. On one hand it is suggested that normal tongue position and forward protrusion following disinsertion of genioglossus and geniohyoid muscles is unaffected following fracture of genial tubercles. According to Maw and Lindsay this may be possible due to intrinsic muscles of the tongue, palatoglossus and remaining fibres of genioglossus (which are attached to lower mental region of mandible) acting together or in isolation [8].

On the other hand there have been various reports in the literature stating marked mandibular functional impotence, dysphagia, odinophagia, difficulty in lingual movement and speech associated with fracture of genial tubercles [1,3,5]. The clinical problems like protusive ability & control of movements associated with detachment may occur and deserve greater concern than actually given. These findings suggest that importance of intactness of insertion of genioglossus and geniohyoid muscles in various physiologic functions. Therefore the surgical removal of genial tubercles should also aim at reinserting genioglossus and geniohyoid muscle.

CONCLUSION

Ulcers and/or swellings of the floor of the mouth may occur due to a plethora of conditions. The responsibility lies with the clinician to accurately diagnose the problem and differentially segregate it from other conditions. Enlarged genial tubercles may present as a persistent swelling in the floor of the mouth or may also become a cause of recurrent ulceration if subjected to trauma. Therefore the list of differential diagnosis would be incomplete without mention of enlarged genial tubercles if one is looking for swelling/ulceration in the anterior floor of the mouth, in which case, the treatment is simple surgical removal of tubercles and surgical reattachment of the genioglossus muscle.

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