Mandibular Ridge Extension With Bilateral Inferior Transposition of Mental Nerve

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Abstracts: In case extensive atropy of the alveolar process of the mandible may result in the mental foramen becoming located on or near the crest of the residual ridge. This frequently is the cause of discomfort for the denture wearers. When adjustment of the denture does not alleviate the problem, it may be necessary to transpose the nerve and this is also indicated when the alveolar sulcus is to be deepened in this region. We presented case of severely resorbed mandibular ridge with chief complaint of numbness and discomfort over wearing denture which is treated by supraperiosteal vestibuloplasty with bilateral inferior transpositioning of mental nerve. This management resulted in increased vestibular depth for denture retention and stability, as well as it helped us to avoid numbness and discomfort. [Patil R et al NJIRM 2012; 3(5) : 157-161]

Key words: Mandibular ridge atropy, ridge extension, bilateral mental nerve transposition

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Introduction: Vestibuloplasty improves the denture-retentive and stabilizing capabilities of the alveolar ridge. The technique is simple and makes no attempt to cure the alveolar atropy; rather it attempts to exposure and make available for denture construction that bone which is still present. Extensive atropy of the alveolar process of the mandible may result in the mental foramen becoming located on or near the crest of the residual ridge. Mental nerve then may emerge on the superior surface of the jaw. When adjustment of the denture does not alleviate the problem, it may be necessary to transpose the nerve and this is also indicated when the alveolar sulcus is to be deepened in this region[1]. The first case of inferior alveolar nerve (IAN) repositioning was published in 1977 by Alling.

Following tooth loss, a cortical bone suffers greater resorption on the vestibular than on the lingual aspect, and patients typically present narrow and low alveolar crests. In case of moderate to severe atropy, the bone height between the alveolar crest and dental canal is small, and limited to only a few millimeters[2-3]. The dental nerve penetrates the mandibular canal accompanied by the corresponding blood vessels, forming the inferior dental plexus, from which innervations in turn emerges for the teeth and gingival tissue. The trajectory finally gives rise to the mental nerve which may innervate the incisors and canines before emerging to the exterior[4]. IAN repositioning was advised for prosthetic rehabilitation in patients with severe atropy and emergence of the nerve close to the alveolar crest[5]. Various vestibuloplasty procedures are explained like, Kruger[6] in an excellent review article in 1958 evaluated the Kanzanjian[7], Clark[8]. Osseointegrated dental implants are often placed in posterior mandible, mostly for support of fixed restorative prostheses. In many cases bone has atrophied, such that sufficiently long fixtures cannot be placed without encroaching on the inferior alveolar nerve. In this situation, restorative options include use of short fixtures, onlay bone grafting to increase ridge height, and more complicated and detailed imaging studies to allow positioning of implants alongside and not into the nerve canal during the procedure. Another option is to move the IAN laterally from its canal by either nerve lateralization or nerve transposition[9]. But the major clinical difficulty associated with IAN transposition is temporary or permanent dysfunction of the nerve. In our case we advised vestibuloplasty with bilateral inferior transpositioning of mental nerve.

Case report: A fifty five years old male patient reported to our unit with complaining of numbness at anterior region of mandible along with loose and discomfort to wear the existing mandibular denture. On oral examination severely resorbed mandibular alveolar ridge with inadequate vestibular depth was observed (Fig.1). Orthopantamograph was advised to study the remaining alveolar ridge architecture and position of the mental foramina bilaterally (Fig.2). It was confirmed that the position of the mental foramina was more towards the alveolar crest. And this was the cause for the numbness and the

discomfort during denture wearing. Case was planned for vestibuloplasty under local anesthesia by using Clark's method to gain the vestibular depth which will improve the denture retention and stability. At the same time, bilateral inferior transpositioning of the mental nerve was also planned to eliminate the discomfort and numbness.

Fig.1 Pre operative severely resorbed ridge

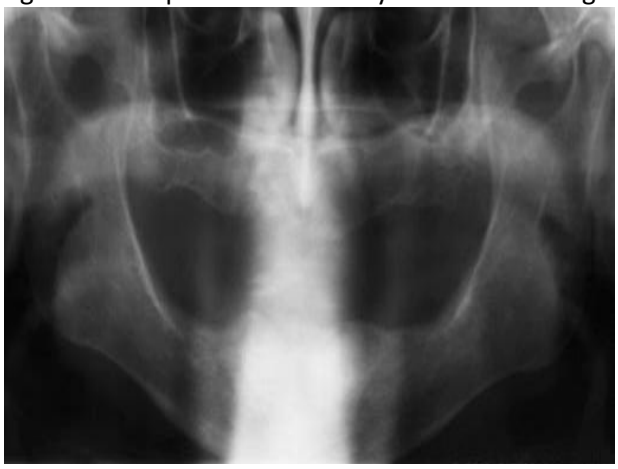

Fig.2 Pre operative orthopantamograph

Fig.3 Incision and supraperiosteal dissection

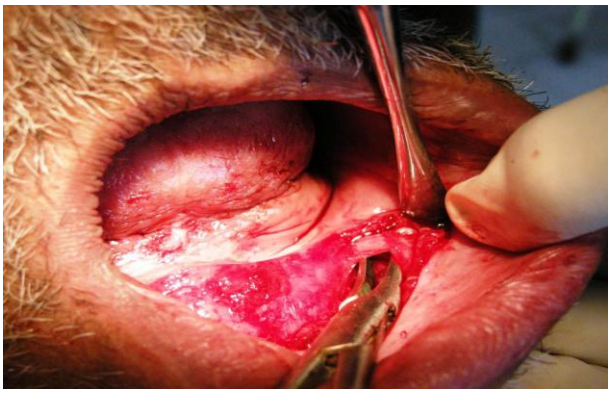

Fig.4 Identification of left mental nerve and foramina

Fig.5 Identification of right mental nerve and foramina

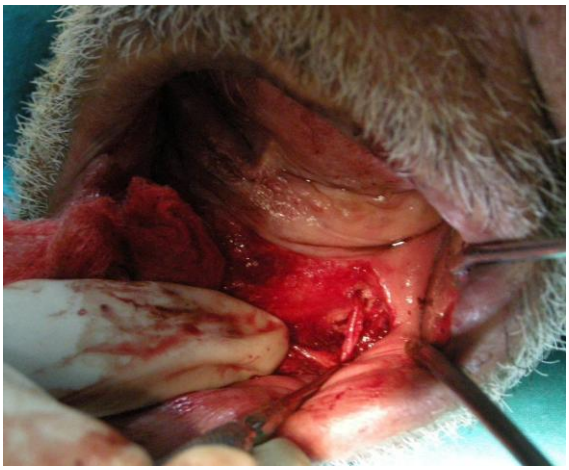

Fig.6 Inferior transposition of mental nerve


Fig.7 Suturing of mucous membrane to periosteum


Fig.8 Mandibular ridge extension with template placement and stabilization

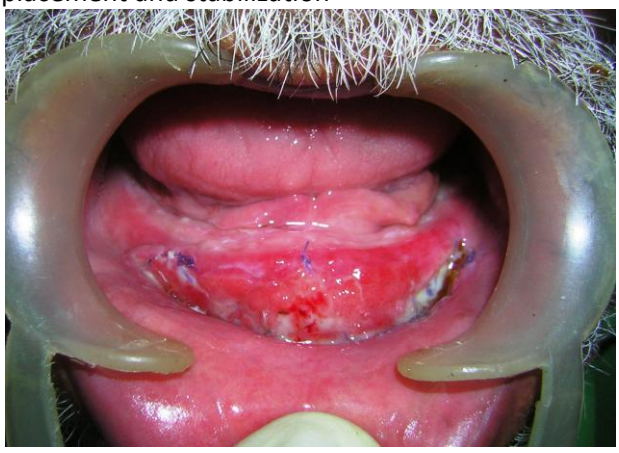
Fig.9 Secondary healing with epithelization after a week


Fig.10 Post operative intraoral view after 3 years of follow up

Surgical procedure: After anaesthetizing the bilateral inferior alveolar nerve by using 2% lignocaine with1: 2,00,000 adrenalin. Incision was made slightly labial to crest of the ridge followed by supraperiosteal blunt dissection to achieve the sulcus depth (Fig.3).

The lip mucosa was undermined from the edge of incision to the vermillion mucosal border. Bilaterally, blunt dissection was carried out and extended posteriorly until the neurovascular bundle emerging from the foramina comes in to the view. It was noticed superiorly positioned mental foramina and the structures towards the crest. The nerve bundle was identified bilaterally and lifted with a nerve hook and protected (Fig.4, Fig.5). By means of a fissure bur, a vertical groove was made starting just below the mental foramina, and extending inferiorly by 5-8mm (Fig.6). The groove extends just through the cortex in to the medullary bone. Once the groove preparation completes, a small cortical bridge below the nerve was removed with a thin narrow chisel which prevents the possibility of damaging the nerve with the bur. The freed nerve then carefully moved in to the new position and same procedure was carried out on opposite side. In the anterior region, the mucosal flap was sutured inferiorly to periosteum by using vicryl 3-0 suture material to increase the vestibular depth (Fig.7). Vestibular depth was maintained by acrylic template and which was stabilized by means of circummandibular sutures (Fig.8). After a week the template was removed and raw surface of extended ridge was left for secondary

epithelization (Fig.9). Excellent secondary epithelization healing was observed without any neurosensory complications. Later a new complete denture was advised and patient was followed up for three years (Fig.10).

Discussion: We reviewed a number of studies in the literature on repositioning of the inferior alveolar nerve, mental nerve for dentures and implant placement in mandibular posterior sector. Kan and others pointed out that the amount of bone superior to the IAN canal is often insufficient for placement of fixtures of the desirable length. In addition, the bone that is present superior to the IAN is often of poor quality than its cortical counterpart. These factors and the fact that shorter implants have been associated with higher failure rates. Apart from longer implants, IAN transposition allows for use of a greater number of implants, which improves the overall strength of the final prosthesis. But the major clinical difficulty associated with IAN transposition is temporary or permanent dysfunction of the nerve, which patients report as altered sensation of the lower lip and chin[9].

Rosenquist et al. in turn published the largest series (114 patients subjected to the lateralization technique), with the longest duration of follow-up. Implant osseointegration was 95% after 6 months, and 93% after 18 months. Eighty percent of the patients experienced neurosensory changes. After 18 months, 94% had normalized, with 4% continued to present hypoesthesia that was well tolerated. Only one patient suffered permanent complete anesthesia[10].

There is no advantage to perform vestibuloplasty and nerve transposition as separate procedures. So, we performed vestibuloplasty in mandibular anterior region; simultaneously, bilateral inferior transpositioning of mental neurovascular bundle and obtained satisfactory result.

This case report demonstrates perfection of denture quality can be achieved by tissue side correction. In this patient, we explained all the possible and alternative management including endosteal implants for the improvement of quality of oral rehabilitation. The amount and height of availability of bone with more superiorly positioned mental foramen and its nerve bundle; we decided that, this method is suitable due to its simplicity, economic, and effective without any neurosensory alterations.

Conclusion: We concluded that, in selected cases a satisfactory result can be achieved by supraperiosteal vestibuloplasty with inferior mental nerve transposition is useful adjunct for managing the atrophic anterior mandible with new complete dentures. The risk of temporary or permanent dysfunction of the mental nerve appears minimal and or rare.

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