Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 6
Open Access

A Case Report on Non – Union of Mandibular Parasymphysis Fracture: A Rare Case

Dr. Yashasvi Kanoria[1], Dr. Sanjay Byakodi[2], Dr. Amit Basannavar[3], Dr. Mushtak Khan[4], Dr. Vishnuchandra Menon[5], Dr. Devesh Agiwal[6]

[1,4,5,6] Postgraduate at Bharati Vidyapeeth Deemed To Be University Dental College and Hospital, Sangli.
[2,3] Professor, Bharati Vidyapeeth Deemed To Be University Dental College and Hospital, Sangli

Cite this paper as: Dr. Yashasvi Kanoria, Dr. Sanjay Byakodi, Dr. Amit Basannavar, Dr. Mushtak Khan, Dr. Vishnuchandra Menon, Dr. Devesh Agiwal(2024) A Case Report on Non – Union of Mandibular Parasymphysis Fracture: A Rare Case. Frontiers in Health *Informatics*, *13(6) 378-385*

ABSTRACT

Mandibular non – union is rare complication of mandibular fractures having very little incidence and even lesser reported cases in the literature. It represents a failure of the fracture hematoma to undergo transformation into an osteogenic matrix and hence it is converted into non – osteogenic fibrous tissue thus showing signs of hypermobility and increased range of motion. There are no definite guidelines for the management of mandibular non – union but usual treatment methodology includes use of reconstruction plates. In the following case report we describe the management of a case of non – union using miniplates and bone graft.

KEYWORDS: Mandibular Non – Union, Mal-union, Mandibular Fracture Complications, Mandibular Fractures

INTRODUCTION:

Mandibular fractures are most common facial fractures that present with the need for surgical intervention. If left untreated, they tend to disharmonize the occlusion of the patient along with a change in degree of mouth opening. They also lead to facial asymmetry. Goals for surgical management include restoration of most stable and harmonious occlusion however, the lack of osseous healing after an adequate period of time (usually 6 months in long bones and 12 weeks in the mandible) leads to fibrous union / non union[1]. The reported incidence of mandibular nonunion is around 2.8 – 3.9 % of all reported cases as studied by Mathog and Clayman et. al. in 2000[2]. Histologically, an absence of identifiable osteogenic tissue is present while radiographically there may not be any evidence of progressive decrease in radiolucency at the fractured site along with “eburnation” of bone ends in the latter stages[3].

CASE REPORT:

A 22-year-old male patient presented with a chief complaint of mobile anterior region of lower jaw since the past 2 years. The patient reported that he suffered trauma due to road traffic accident approximately 2.5 years back and was hospitalized over a period of 6 months for the same. The patient’s relatives report a positive history of loss of consciousness of unknown duration, vomiting and intra – oral bleed after trauma. Patient was admitted to a local hospital where he underwent craniotomy procedure and was on tracheostomy tube for airway management. Patient was in intensive care for a period of 1 month and was later shifted to the ward. Patient was discharged once he was neurosurgically stable and fit however no maxillofacial management was done in that period.

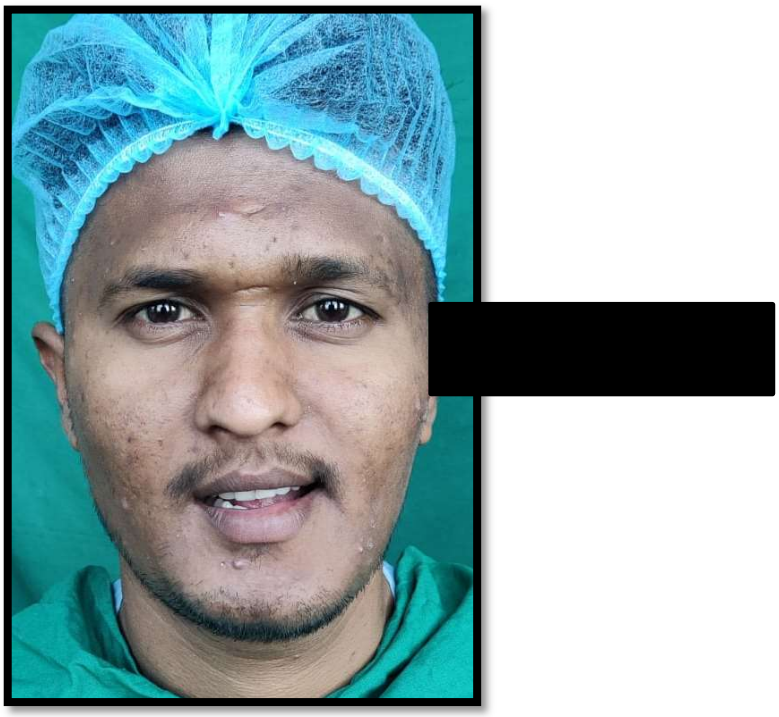

Figure 1: Clinical Photograph of patient

Patient started noticing mobile left and right anterior mandibular segments almost 2 years previously and now presents with the same complaint. Clinical examination reveals a deviation of the lower jaw to the left side along with deranged occlusion having cross-bite on left side extending up till the canine while Angle's Class 1 molar relation exists on Right Side. There was also grade III mobility with respect to 32 which is more lingual compared to the adjacent dentition.

Figure 2: Clinical Photographs of Patient's Pre - Operative Occlusion

Figure 3: Occlusal Photographs of Patient's Maxillary and Mandibular Arches

Orthopantomogram revealed discontinuity of the mandibular bone on the left parasymphysis region along with eburnation of the bony ends suggestive of fracture of the left parasymphysis region of the mandible that has healed and there is non – union of the fractured segments. A 3 Dimensional reconstruction of the Computed Tomographic Scan of the face also confirmed the diagnosis of the non – union of fractured left parasymphysis of the mandible.

Figure 4: Orthopantomogram of the Patient revealing fracture between 32 and 33.

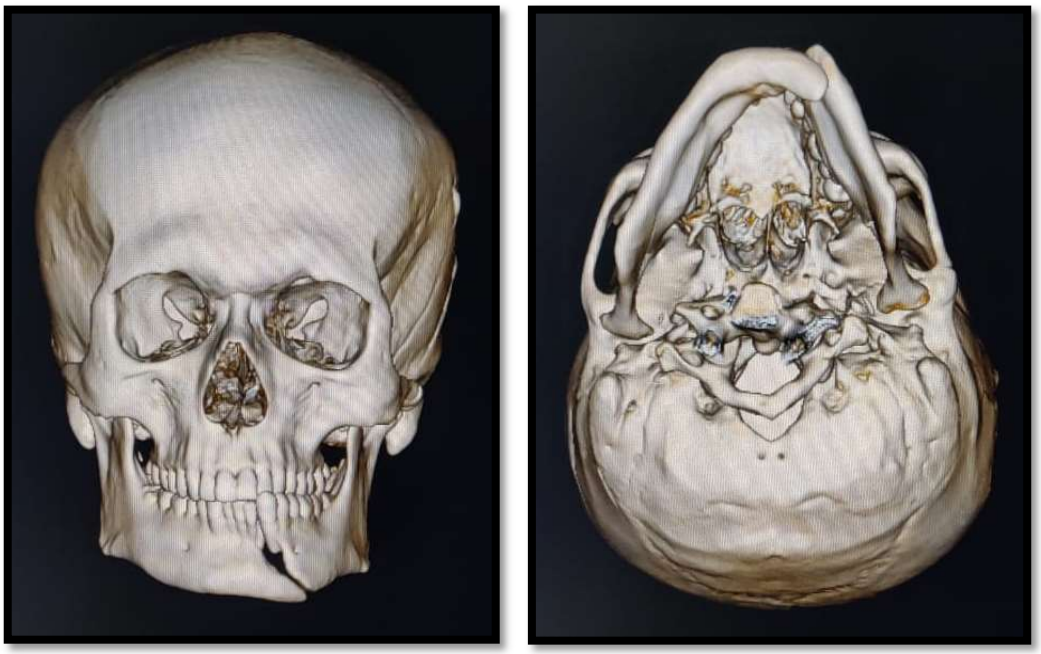

Figure 5: 3D Reconstruction of Computed Tomographic Scan revealing non – union of fractured segments along with eburnation of the bone.

After thorough clinical and radiographic examination, the decision was taken for Open Reduction and Internal Fixation and placement of Bone Graft between the two fractured segments under General Anaesthesia.

Under all aseptic condition, right nasal intubation was done, airway was secured and general anesthesia was induced. Erich arch bar was placed on the maxillary arch and interdental ivy-eyelet wires were placed in 36 and 46 regions. Local Infiltration was administered using 2% Lignocaine with 1:80,000 Adrenaline solution and an Intra – Oral Crevicular Incision was given from 33 to 43 along with vertical releasing incisions on either side while preserving the mental nerve and vessels. Full thickness Mucoperiosteal flap was reflected and the fracture site was exposed. All fibrous tissue encasing both fractured segments were removed, on – table surgical decision was taken to extract 32 for the removal of premature occlusal interference and to achieve the best possible occlusion. Intermaxillary fixation was done after the above surgical procedure and both fractured segments were fixed using a continuous stainless steel plate (2mm thickness) and a Titanium miniplate (2mm thickness). Punch cuts were given on the bone using a 2mm round bur until fresh bleeding was induced to provide a favourable bed for the placement of “Osseograft” which is a xenograft containing demineralized bone matrix graft following which it was covered with a membrane for Guided Tissue Regeneration to isolate the region and prevent formation of granulation tissue. Intermaxillary Fixation was removed and occlusion of the patient was assessed prior to closure. Closure was done utilizing resorbable 3 – 0 vicryl and the surgical site was encased with periodontal dressing following which the patient was extubated uneventfully and shifted to post – operative care. Ryle’s Tube was placed so as to prevent contamination of the oral cavity with food substances and a post – operative Orthopantomogram was taken to evaluate surgical outcome.

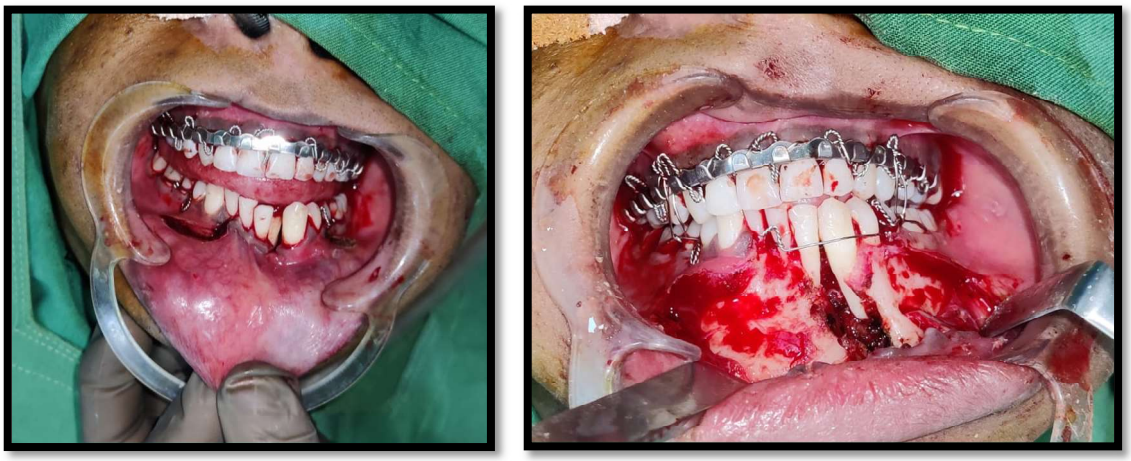

Figure 6: Placement of Incision and Exposure of Surgical Site.

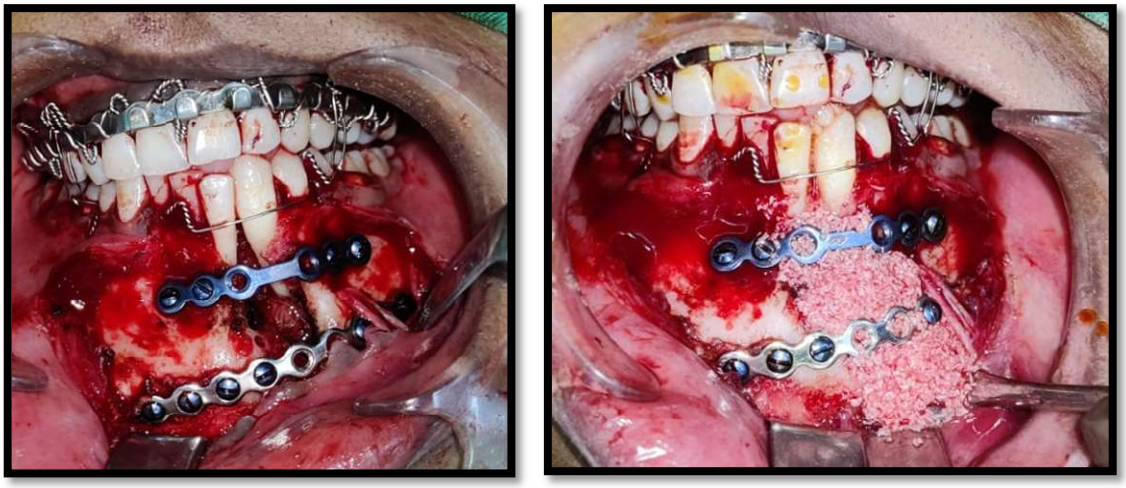

Figure 7: Fixation using Miniplates and Screws and Placement of Bone Graft

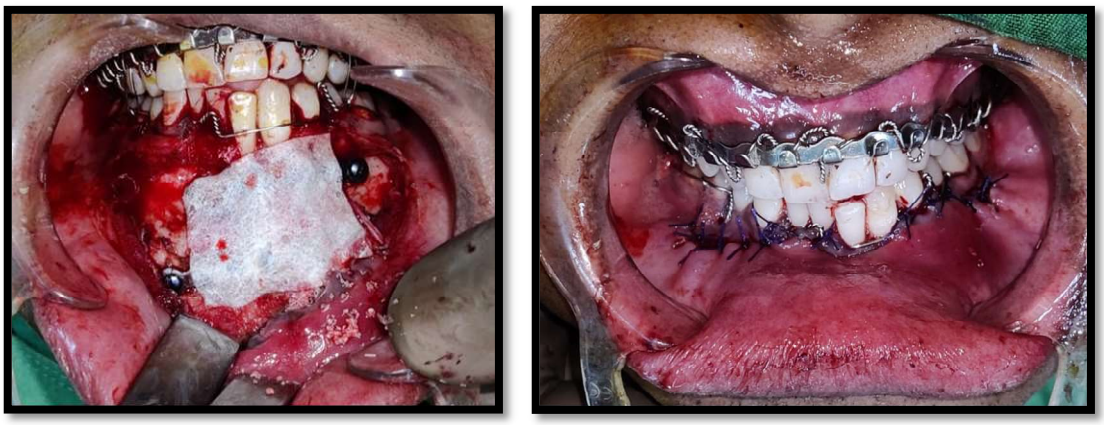

Figure 8: Placement of GTR followed by Closure using 3 – 0 resorbable Vicryl Sutures

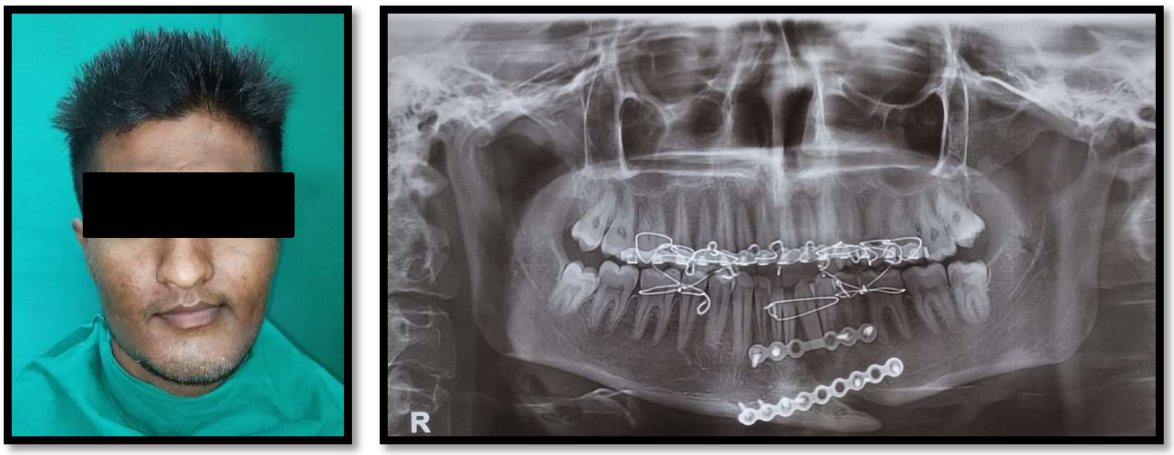

Figure 9: Clinical Image of Patient 2 weeks post – operatively and Orthopantomogram depicting reduced fractured segments using miniplates and screws.

DISCUSSION:

Mandibular Non – Union is a complex injury, the management of which is further complicated due to the presence of multiple treatment options, absence of well – organized guidelines and scant literature thus bringing no help to the surgeon for deciding an optimal treatment pathway.[4] Mandibular non – union occurs with a greater male predilection, with the angle and the body of the mandible being the most common anatomical sites for non – union since these locations are at the greatest risk for torsional and cantilevered forces during initial injury.[5] In edentulous patients, the body of the mandible presents with inadequate vascularity which is accompanied by atrophy of the bone thus leading to non – union. The management of mandibular nonunion was demonstrated by Benson and Alpert in 2006 who presented with guidelines for a Single – Stage treatment for non – union. They established the protocol of fracture debridement and rigid internal fixation followed by immediate bone grafting. They reported a bony union rate of 94% utilizing this approach[7] and this was the approach taken by us for the management of the above patient. Extraction of de – vital 32 which was present in the line of fracture along with debridement of necrotic soft and hard tissue was done as present in the literature.[8] In an article published by Perez and Ellis in 2020, they claimed that bone grafting is necessary for osseous union and also gave guidelines for the management of mandibular non – union fractures based on the distance between the two fractured segments. They stated that there should be at least 4 screws on each side of the gap with no screw being closer than 7 mm due to lesser mineral content and also advocated the placement of bone grafts[9] which was the protocol followed by us for the management of the above case. Another treatment algorithm was presented by Ostrander et. al. in 2018 which has been presented in the image below.[10]

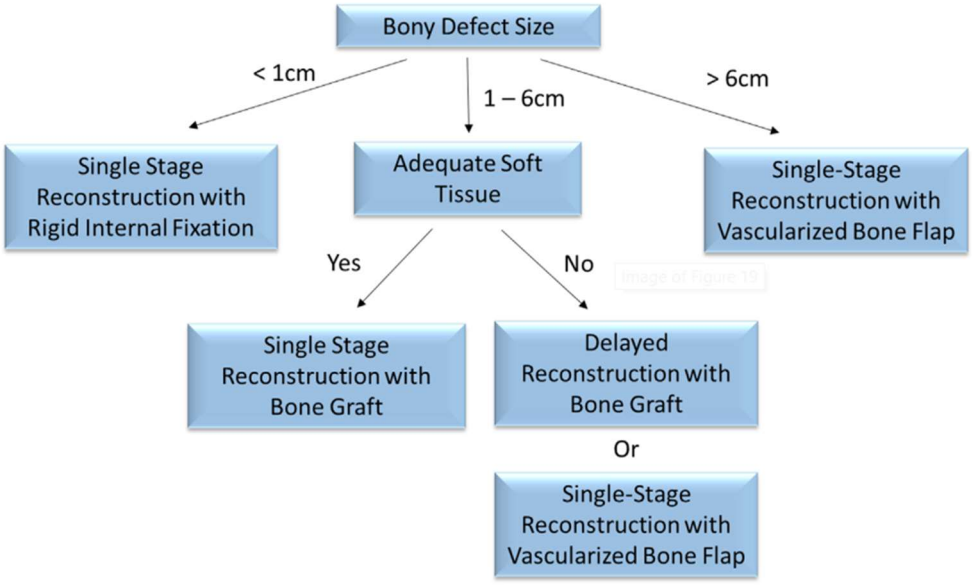

Figure 10: Algorithm for Management of Mandibular Non – Union as per Ostrander et. al. (2018)

To conclude, even with the availability of the above treatment guidelines, mandibular nonunion itself is an uncommon and complex condition requiring careful surgical management. Additional studies are still required for the comparison of the above treatment mechanisms. An immediate single – stage approach is still considered to be the most appropriate treatment option in the vast majority of cases and does not negatively affect any outcomes. The size of the bony defect and soft tissue status are all also essential parameters for determining the surgical and treatment approach and also for the timing of the reconstruction.

REFERENCES

1. Ellis E III. Complications of rigid internal fixation for mandibular fractures. J Craniomaxillofac Trauma 1996;2(02):32–39
2. Mathog RH, Toma V, Clayman L, et al. Nonunion of the mandible: An analysis of contributing factors. J Oral Maxillofac Surg. 2000;58:746.
3. McNaughton T, Bell D, Eburnation. Reference article, Radiopaedia.org (Accessed on 24 Apr 2024) https://doi.org/10.53347/rID-96447
4. Ostrander BT, Wang HD, Cusano A, Manson PN, Nam AJ, Dorafshar AH, Contemporary Management of Mandibular Fracture Nonunion – A Retrospective Review and Treatment Algorithm, Journal of Oral and Maxillofacial Surgery (2018), doi: 10.1016/j.joms.2018.01.027.
5. Buchbinder, D. Treatment of fractures of the edentulous mandible, 1943 to 1993: a review of the literature. J Oral Maxillofac Surg 1993;51:1174-1180.
6. Vega, L. G. Reoperative mandibular trauma: management of posttraumatic mandibular deformities. Oral Maxillofac Surg Clin North Am 2011;23:47-61, v-vi
7. Benson, P. D., Marshall, M. K., Engelstad, M. E., Kushner, G. M., Alpert, B. The use of immediate bone grafting in reconstruction of clinically infected mandibular fractures: bone grafts in the presence of pus. J Oral Maxillofac Surg 2006;64:122-126.

8. Aulakh KK, Gumber TK, Sandhu S. Prognosis of teeth in the line of jaw fractures. Dent Traumatol 2017;33(02):126–132
9. Perez D, Ellis E 3rd. Complications of Mandibular Fracture Repair and Secondary Reconstruction. Semin Plast Surg. 2020 Nov;34(4):225-231. doi: 10.1055/s-0040-1721758. Epub 2020 Dec 24. PMID: 33380907; PMCID: PMC7759430.
10. Contemporary Management of Mandibular Fracture Nonunion—A Retrospective Review and Treatment Algorithm. Ostrander, Benjamin T. et. al. Journal of Oral and Maxillofacial Surgery, Volume 76, Issue 7, 1479 - 1493