European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 07, Issue 2, 2020

Management Of Tmj Ankylosis- Review

Dr.Prakash[1] ,Dr.N.P.Prabhu[2],Dr.Shanmugapriyan[3],Dr.Tharani[4]

Department – Oral and Maxillofacial surgery
Sreebalaji dental college and hospital
Pallikaranai , Chennai – 100
Mail.id:pmht1703@gmail.com

Abstract:Ankylosis means "stiff joints"in greek. Ankylosis of the tmj is an intracapsular union of the disc condylarcomplex to the temporal articular surface that restrict and mandibular movement. Ankylosis may be due to fibrous /bony adhesion between condyle /disc/glenoid fossa and articular eminence that causes inability toopen the mouth beyond 5mm of the interincisal opening due to fusion of the head of the condyle with articular eminence.the management of the ankylosis is to remove the ankylosis mass and create a gap for the free movement of the jaw and to restore the normal esthetic and functional activity. Key word: condylectomy, gap arthroplasty ,interpositional arthroplasty, ankylosis

Introduction:

ankylosis is the development of significant or complete limitation of movement of the tmj by bone or fibrous tissue. The basic surgical objective are to estabilized jaw movement and jaw function to prevent relapse and archive normal growth and occlusion.ankylosis of tmj is an extremely disabling affliction that cause problem in mastication ,digestion,speech,appearance and hygiene. It also has an impact on the psycologic development of the patient and can place his/her life in jeopardy at any time because of the unability to open the mouth[1].86% of cases are due to traumatic ankylosis and the other factors involved in the ankylosis are genetic, neoplasia.ankylosis release is the oldest form of tmj surgery that eveolved from procedure during the 19th centurywhich consist of osteoarthectomy,condylectomy and gap arthroplasty.arthroplasty without interpositional requires a gap of 1-2cm to prevent re-ankylosis with this large gap , ther is a loss of ramus height no support for the rotation mandible.

Material and methods: over 43 article where selected for review following a comprehensive search of the literature from pubmed central.

Etiopathology of tmj ankylosis:

1)trauma:Congenital, at birth (forceps delivery),haemorthrosis,condylar fracture,glenoid fracture 2) infection 3) genetic factors 4) other factors

Pathophysiology:

markey et al[2] done an experiment in donkey with a ankylosis with difficulty in mouth opening. hohl et al subjective that the mandibular condylar fracture in monkey with various modalities bone grafting ,mechanical,chemical damages etc.soung kim histological and immunohistochemical staining in the condylar hyperplasia with rich hyaline cartilage.positive for BMP4 and spread in BMP-2.

Discussion: the management of the ankylosis is depends on stages of ankylosis, associated deformity and age of presentation.the aim of the ankylosis surgery is to remove the ankylosis mass and gap help in mobilization of the mandible . to restore the normal form and function.

Treatment planning should be in the order of 1) surgery:condylectomy/gap arthroplasty/interpositional arthroplasty2)physiotherapy-to activate the mobilaized joint,3)orthognathic surgery-genioplasty for the esthetic corrections,4)speech and the functional therapy,5)psychological councelling.[3] In surgery: esmarch in 1851 was the first to give the surgical method for tmj ankylosis. In 1850-1860condylectomy and arthroplasty . arthroplasty was performed using myofacial flap in 1913 by Murphy blair in 1928[4].the procedure includes arthroplasty of joint cavity ,arthroplasty of joint cavity with free ccg,arthroplasty of joint cavity with temporalis flap insertion in newly created joint cavity accompanished by a simultaneous upper and lower condylectomy on the affected side , distraction of ramus and body on the affected side , reconstruction using alloplastic prosthetic,arthroscopic laser assisted preparation of articular surface , post operative radiotherapy , bilateral arthrotomy.[5] Mosset al in 1968 surgical treatment should not be postponded.based on the moss functional matrix theory the surgery and functional restoration of both the bones and neighbouring soft tissue release the growth potential of the mandible and prevent further development of deformity[6].

Kabans protocol-1990[8]

1)aggressive total excision of the mass it carried out after adequate exposure and identification of the caries site.2)coronoidectomy+myotomy on the affected site to eliminate temporalis muscles restriction.3)contralateral coronoidectomy done if 1 &2 donot result on maximal mouth opening of 35mm.4) lining of the joint with temporalis muscle fasciaor disc will be of salvages.5)ramal height reconstruction with ccgand rigid fixation.6)early post operative mobilization and aggressive physio for 6-12 months7) regular follow up8)growth incompetency orthognathic surgery. In 1816[32] john howship gives a vivid report of the natural history of supporative arthritis of the jaw joint leading to ankylosis . Christopher heath in 1884 described the progress of suppuration of the middle ear lead to sequestration of the mandibular condylar via auditory meatus causing ankylosis balir vp 1913[10] give the operative treatment of ankylosis of mandible . the preariculyar incision used today are essential modification of the blair curvilinear or inverted “l” incision. Rongetti1954 described a modification of lemperts endural osteosclerosis for approaching the tmj.murphy in 1914[12] reported the use of temporalis muscle fascia for interpositional after the lysis of temporomandibular ankylosis ridson in 1934 applied free flap muscle sfor interpositional in tmj muscles for interpoisitional tmj ankylosis contraction is among the strongest tissue in the body. Kanzanjian in 1938 [13]was the first to clarify ankylosis in to true or false ankylosis this classification is further modified on the basis of histopatholoigal variation into fibrous or bony ,fibro-osseous and cartilaginous by miller . The first dermis disc replacement was given by geograde X and altany f in 1957 the tissue survive and forms an effective interpositional scar. Davidson 1959[14] gives the fate of autogenous cartilage graft as an interpositional material . Topazian in 1966 compared gap arthroplasty with interpositional arthroplasty in the treatment of tmj ankylosis in 15 patients . of the fifteen ,who had gap arthroplasty 8 had a recurrence .of 5 patients had interpositional arthroplasty none had a recurrence within 7 month past operatively. Kennett in 1973 suggested ccg for the interpositional arthoplasty in tmj ankylosis.in 1987[15] obweger h.l.o hadjianghlov coined the bird face deformities to describe the micrognathic mandible and receding chin.p.c.salins in 2000 gives the new technique osteotomy performed inferior to the base of ankylotic mass and autogenic tissue used as interpositional to prevent reankylosis. Dimitroulis .g 2007 investigate the radiological fate of dermis fat graft within temporomandibular joint using mri there was no statistically significant different in the size of graft .fat tissue growth and maintainence show the negative effects by intermittent compressive force within the joint space itself. Andrew .m.felstead and peter .j. revinton 2011[16]. Says the surgical management of tmj ankylosis in ankylosing spondylitis. SM Balaji in 2003 [17]reported favorable result using modified temporomandibular anchor age in a case of ankylosis with 6years of follow up . tmf is placed between the bony stump and the distal border and sutured to the submandibular fissure cushion and elasticity and increased bulk of the flap can be prevented of post op open bite caused by shortening of the ramus after removal of the ankylosis mass.

Conclusion:the success of the surgical management in ankylosis is by increase in mouth opening and in the normal contour of the face in mouth opening without any deviation. The supportive therapy is highly required in tmj ankylosis for normal structural and functional activity.

Reference:

1. Kazanijan VH. Ankylosis of the temporomandibular joint. Surg Gyncol Obstet. 1938;67:333–48. [Google Scholar]

2. Akama MK, Guthua S, Chindia ML, Kahuho SK. Management of Bilateral Temporomandibular Joint Ankylosis in Children: Case Report. East African Medical J. 2009;86(1):45–48. [PubMed] [Google Scholar]

3. Motta A, Louro RS, Medeiros PJ, Capelli J. Orthodontic and surgical treatment of a patient with an ankylosed temporomandibular joint. Am J Orthod Dentofacial Orthop. 2007;131:785–96. [PubMed] [Google Scholar]
4. Sawhney CP. Bony ankylosis of the temporomandibular joint: follow-up of 70 patients treated with arthroplasty and acrylic spacer interposition. Plast Reconstr Surg. 1986;77:29–38. [PubMed] [Google Scholar]
5. Durr ED, Turlington EG, Foote RL. Radiation treatment of heterotopic bone formation in the temporomandibular joint articulation. Int J Radiat Oncol Biol Phys. 1993;27:863–69. [PubMed] [Google Scholar]
6. Zhi K, Ren W, Zhou H, Gao L, et al. Management of Temporomandibular Joint Ankylosis: 11year's clinical experience. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;108:687–92. [PubMed] [Google Scholar]
7. Gundlach KK. Ankylosis of the Temporomandibular joint. J Cranio-Maxillo-Fac Surg. 2010;38:122–30. [PubMed] [Google Scholar]
8. Kaban LB, Bouchard C, Troulis MJ. A Protocolfor Management of Temporomandibular Joint Ankylosis in Children. J Oral Maxillofac Surg. 2009;67:1966–78. [PubMed] [Google Scholar]
9. Loveless TP, Bjornland T, Dodson TB, Keith DA. Efficacy of Temporomandibular Joint Ankylosis Surgical Treatment. J Oral Maxillofac Surg. 2010;68:1276–82. [PubMed] [Google Scholar]
10. Wright GW, Heggie AC. Bilateral temporomandibular joint ankylosis after bimaxillary surgery. J Oral Maxillofac Surg. 1998;56:1437–41. [PubMed] [Google Scholar]
11. Humphry GM. Excision of condyle of lower jaw. Assoc Med J. 1856;4:61–62. [PMC free article] [PubMed] [Google Scholar]
12. Medra AMM. Follow up of Mandibular Costochondral Grafts after Release of Ankylosis of the TMJ. Br J Oral Maxillofac Surg. 2005;43:118–22. [PubMed] [Google Scholar]
13. Mercuri LG. Alloplastic *vs.* Autogenous Temporomandibular Joint Reconstruction. In: Indresano AT, Haug RH, editors. Oral and Maxillofacial Surgery Clinics of North America. 3. Vol. 18. Elsevier; Philadelphia: 2006. pp. 399–411. [PubMed] [Google Scholar]
14. Mercuri LG, Alcheikh Ali F, Woolson R. Outcomes of Total Alloplastic Replacement with Peri-articular Autogenous Fat Grafting for Management of Re-ankylosis of the Temporomandibular Joint. J Oral Maxillofac Surg. 2008;66:1794–803. [PubMed] [Google Scholar]
15. Moses JJ, Lee J, Arredondo A. Arthroscopic laser debridement of the temporomandibular joint fibrous and bony ankylosis: case report. J Oral Maxillofac Surg. 1999;56:1104–6. [PubMed] [Google Scholar]
16. Reid RR, Cooce H. Postoperative ionizing radiation in the management of heterotopic bone formation in the temporomandibular joint. J Oral Maxillofac Surg. 1999;57:900–5. [PubMed] [Google Scholar]
17. Moss ML, Rankow RM. The role of the functional matrix in mandibular growth. Angle Orthod. 1968;38:95–103. [PubMed] [Google Scholar]
18. El-Mofty S. Cephalometric studies of patients with ankylosis of the temporomandibular joint following surgical treatment. Oral Surg. 1979;48:92–96. [PubMed] [Google Scholar]
19. Mercuri LG, Swift JQ. Considerations for the Use of Alloplastic Temporomandibular Joint Replacement in the Growing Patient. J Oral Maxillofac Surg. 2009;67:1979–90. [PubMed] [Google Scholar]

20. Guelnick PJ, Sinsel NK. The “Eve” procedure: The transfer of vascularized seventh rib, fascia, cartilage and serratus muscle to reconstruct different defects. Plast Reconstr Surg. 1996;97:527–35. [PubMed] [Google Scholar]
21. Taylor GI. Reconstruction of the mandible with free composite iliac crest bone graft. Ann Plast Surg. 1982;9:361–76. [PubMed] [Google Scholar]
22. Wax MK, Winslow CP, Hansen J, et al. A retrospective analysis of temporomandibular joint reconstruction with free fibula microvascular flap. Laryngoscope. 2000;110:977–81. [PubMed] [Google Scholar]
23. Matukas VJ, Szymela VF, Schmidt JF. Surgical treatment of bony ankylosis in a child using a composite cartilage – bone iliac crest graft. J Oral Surg. 1980;38:903–5. [PubMed] [Google Scholar]
24. Stucki-McCornick S, Winick R, Winick A. Distraction osteogenesis for the reconstruction of the temporomandibular joint. NYSDJ. 1998;41:36–41. [PubMed] [Google Scholar]
25. Cascone P, Agrillo A, Spuntarelli G, et al. Combined surgical therapy of temporomandibular joint ankylosis and secondary deformity using intraoral distraction. J Craniofac Surg. 2002;13:401–9. [PubMed] [Google Scholar]
26. Papageorge MB, Apostolidis C. Simultaneous mandibular distraction and arthroplasty in a patient with temporomandibular joint ankylosis and mandibular hypoplasia. J Oral Maxillofac Surg. 1999;57:328–33. [PubMed] [Google Scholar]
27. Mercuri LG. Considering total temporomandibular joint replacement. Cranio. 1999;17:44–48. [PubMed] [Google Scholar]
28. Mercuri LG. Alloplastic temporomandibular joint reconstruction. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1998;85:631–37. [PubMed] [Google Scholar]
29. Quinn PD. Lorenz prosthesis. Oral Maxillofac Surg Clin North Am. 2000;12:93–104. [Google Scholar]
30. Guarda NL, Manfredini D, Ferronato G. Temporomandibular joint total replacement prosthesis: current knowledge and considerations for the future. Int J Oral Maxillofac Surg. 2008;37:103–10. [PubMed] [Google Scholar]
31. Bisla RS, Inglis AE, Ranawat CS. Joint replacement surgery in patients under thirty. J Bone Joint Surg Am. 1976;58:1098–106. [PubMed] [Google Scholar]
32. Ruddlesdin C, Ansell BM, Arden GP, Swann M. Total hip replacement in children with juvenile chronicarthritis. J Bone Joint Surg Br. 1986;68:218–22. [PubMed] [Google Scholar]
33. Mercuri LG, Edibam NR, Giobbie-Hurder A. 14-Year Follow-Up of a Patient Fitted Total Temporomandibular Joint Reconstruction System. J Oral Maxillofac Surg. 2007;65:1140–48. [PubMed] [Google Scholar]
34. Mercuri LG. Discussion on: Van Loon et al., 1995: Evaluation of temporomandibular joint prostheses: review of the literature from 1946 to 1994 and implications for future prosthesis designs. J Oral Maxillofac Surg. 2005;53:996–97. [PubMed] [Google Scholar]
35. MacIntosh RB. The use of autogenous tissue in temporomandibular joint reconstruction. J Oral Maxillofac Surg. 2000;58:63–69. [PubMed] [Google Scholar]
36. Ellis E, Schneiderman ED, Carlson DS. Growth of the mandible after replacement of the mandibular condyle: An experimental investigation in Macaca mulatta. J Oral Maxillofac Surg. 2002;60:1461–71. [PubMed] [Google Scholar]
37. Saeed NR, Kent JN. A retrospective study of the costochondral graft in TMJ reconstruction. Int J Oral Maxillofac Surg. 2003;32:606–9. [PubMed] [Google Scholar]
38. Perrott DH, Umeda H, Kaban LB. Costochondral graft construction/reconstruction of the ramus/condyle unit: Long-term follow-up. Int J Oral Maxillofac Surg. 1994;23:321–28. [PubMed] [Google Scholar]
39. Kaban LB, Perrott DH. Discussion: Unpredictable growth pattern of costochondral graft. Plast Reconstr Surg. 1992;90:887–89. [PubMed] [Google Scholar]
40. Peltomäki T, Vahatalo K, Ronning O. The effect of unilateral costochondral graft on the growth of the marmoset mandible. J Oral Maxillofac Surg. 2002;60:1307–14. [PubMed] [Google Scholar]

41. Matsuura H, Miyamoto H, Ishimaru J-I, et al. Effect of partial immobilization on reconstruction of ankylosis of the temporomandibular joint with an autogenous costochondral graft: an experimental study in sheep. Br J OMS. 2001;39:196–203. [PubMed] [Google Scholar]
42. Perrott DH, Kaban LB. Temporomandibular joint ankylosis in children. Oral Maxillofac Clin North Am. 1994;6:187–99. [Google Scholar]
43. Mercuri LG. Alloplastic temporomandibular joint reconstruction. J Oral Surg. 1998;85:631–37. [PubMed] [Google Scholar]
44. Saeed NR, Hensher R, McLeod N, Kent JN. Reconstruction of the Temporomandibular Joint Autogenous Compared with Alloplastic. Br J Oral Maxillofac Surg. 2002;40:296–98. [PubMed] [Google Scholar]
45. Mercuri LG. Commentary. Condyle Replacement after Tumor Resection: Comparison of Individual Prefabricated Titanium Implants and Costochondral Grafts. Oral Surg Oral Med, Oral Pathol, Oral Radiol, Endodontol. 2009;108:153–55. [PubMed] [Google Scholar]
46. Mercuri LG. Temporomandibular Joint Reconstruction. In: Fonseca R, editor. Oral and Maxillofacial Surgery. Chapter 51. Elsevier; Philadelphia: 2008. pp. 945–60. [Google Scholar]
47. Maki MH, Al-Assaf DA. Surgical management of temporomandibular joint ankylosis. J Craniofac Surg. 2008;19:1583–88. [PubMed] [Google Scholar]
48. Guarda-Nardini L, Manfredini D, Ferronato G. Total temporomandibular joint replacement: A clinical case with a proposal for post-surgical rehabilitation. J Cranio-Maxillofac Surg. 2008;36:403–9. [PubMed] [Google Scholar]