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Epidemiological study of temporomandibular joint ankylosis cases in a tertiary center

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Abstract

Background: Temporomandibular joint ankylosis is the fusion of mandibular condyle to the glenoid fossa, which causes distressing conditions. It may be due to trauma or infection. Temporomandibular joint Ankylosis is a significant problem in India, aggravated by the delay of diagnosis due to various factors. The iatrogenic delay is a main reason why patients suffer in pain and ultimately get jaw lock due to ankylosis. The aim of this study is to determine the frequency of TMJ Ankylosis and treatment given at a tertiary health centre dental hospital among the general population over a period of two years.

Materials and Method: A longitudinal cross sectional study for 17 patients (6 males, 11 females) aged 5-40 years old. Data were collected from patients records registered from January 2017 to December 2018.

Results: Females were more affected than males, the most affected age group was 7-14 years old, bilateral ankylosis more common than unilateral, intra capsular ankylosis is the most common type, and micrognathia is the most common deformity. 17 patients received treatment, coronoidectomy with interpositional arthroplasty with costochondral graft and physiotherapy is the most preferable treatment method. Also Condylectomy + Interpositional arthroplasty with temporal fascia + Physiotherapy and Distraction osteogenesis + Gap arthroplasty + Coronoidectomy + Physiotherapy were used. All the patients received treatment and undergoing regular follow up.

Conclusion: The prevalence of TMJ ankylosis among children was high; the most common causes were trauma and infection, whereas most of patients came with intracapsular type ankylosis in children leads to facial deformities. Improvement of awareness regarding condyle fracture is required.

Keywords: Epidemiological, temporomandibular, ankylosis cases, tertiary center

Introduction

Temporomandibular joint (TMJ) ankylosis refers to the immobility or adhesion between the mandibular condyle and the glenoid fossa, maxilla, zygoma or the base of the skull [1]. This adhesion classified as fibrous or bony [2]. TMJ ankylosis is usually related with trauma, systemic infection, or systemic diseases such as ankylosing spondylitis, rheumatoid arthritis, and psoriasis. It can also be congenital or secondary to severe rheumatoid arthritis or tumors in the TMJ region or may develop as a result of orthognathic surgery [1-3-4]. In TMJ ankylosis, mouth opening becomes limited and the patient experiences problems associated with facial growth, chewing, digestion, speech, aesthetics and oral hygiene maintenance [5]. The mandibular deficiency and craniofacial abnormalities and complications can lead to obstructive sleep apnea (OSA) [6-7]. The incidence of TMJ ankylosis has decreased because of the availability of advanced methods for the treatment of condylar fractures and the use of antibiotics for the treatment of infections; however, this condition is still common in some deprived parts of the world [6]. The management goal in TMJ ankylosis is removal of the ankylotic mass, restoring the form and function of the joint, mouth opening, relief of upper airway obstruction, and prevention of recurrence. A number of surgical approaches have been advised to restore normal joint functioning and prevent re-ankylosis [8]. Three basic techniques are used; gap arthroplast, interposition arthroplasty and joint reconstruction [9-10] along with physiotherapy. The purpose of this study was to draw epidemiological (frequency, age, sex, etiology) clinical and imaging aspects of TMJ ankylosis in tertiary health centre of India.

Materials and Methods

This longitudinal cross-sectional tertiary health centre hospital based study was carried out to determine the pattern of TMJ ankylosis among general population, it consist of patients who were diagnosed with TMJ ankylosis and underwent surgical treatment in the period January 2017 to December 2018. Patients who had TMJ disorder other than ankylosis or the patient who didn't turn up for surgery were excluded. Total coverage of all patients right from diagnosis, treatment and follow up from January 2017 to December 2018 who fulfilled inclusion and exclusion criteria were included accordingly the sample size was 17 patients, the age of the patients range between 5 and 40 years old. Data was collected from case history of the patients and questioning their attendees, data collection form was used, the completed data collection sheet contained the following items regarding the age, gender, side, type of ankylosis, mouth opening during theatre and treatment: Age, Gender, Side, Bilateral, Unilateral, Type, Treatment modality, Data was collected, summarized, coded and frequency distribution tables, graph were used to represent the results.

Results

A total of 17 patients were included in this study, according to their gender result showed that 35% (n=6) were females while 65% (n=11) were males. The age of the patients with ankylosis ranged from 0 to 40 years old, among them the highest percentage group was from 7-14 years 65% shown in Table 1. The study revealed that bilateral ankylosis was the predominant one account (53%), and the unilateral ankylosis on the right side (29%) was more predominant than the left side (18%) shown in Figure 2. According to the types the majority of patients presented with intracapsular than extracapsular fracture shown in Figure 3.

Table 1: Shows age distribution among the study sample

Age	Number	Percentage
0 – 6 yrs	0	0
7 – 14 years	11	65%
Above 15	6	35%
Total	17	100%

Table 2: Treatment provided for ankylosis patients.

Treatment provided for Ankylosis	Number of patients
Interpositional arthroplasty with temporalis fascia + Physiotherapy	4
Interpositional gap arthroasty + costochondral graft + Physiotherapy	6
Coronoidectomy + Physiotherapy	2
Condylectomy + Physiotherapy	3
Distraction osteogenesis + Interpositional arthroplasty + physiotherapy	2

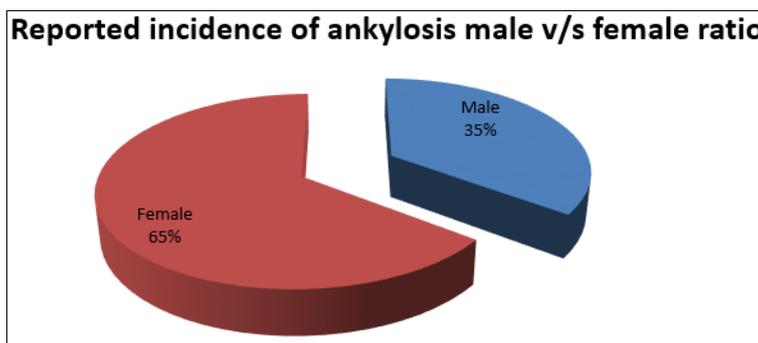


Fig 1: Male: Female

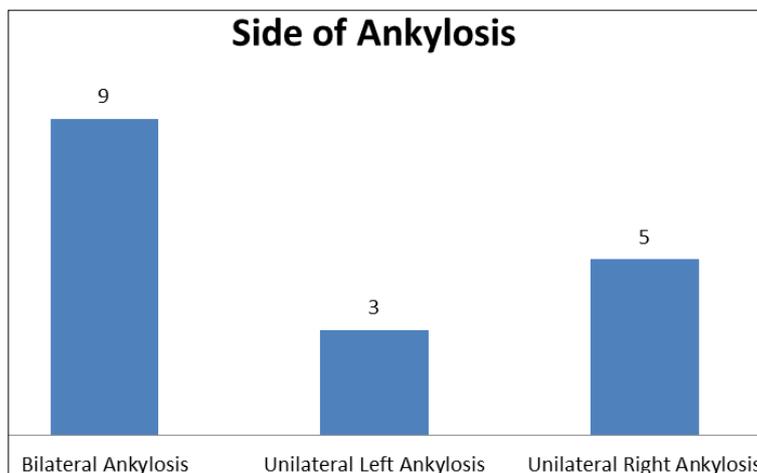


Fig 2: Shows the distribution of the affected side among study sample.

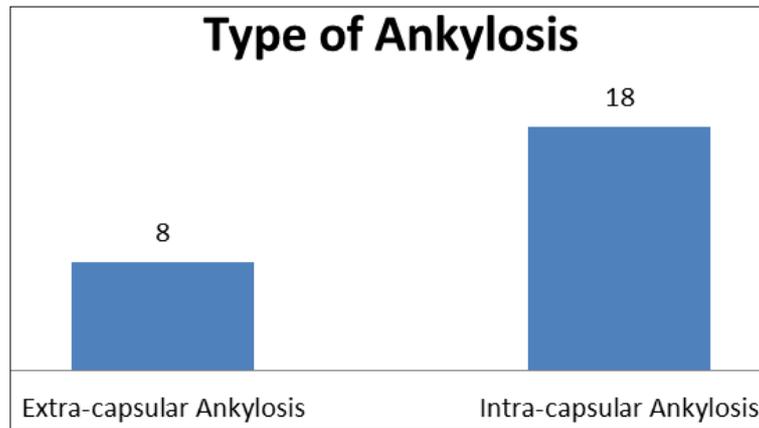


Fig 3: Shows the distribution of the ankylosis type among the study sample.

Discussion

The aim of this study was to determine the frequency of TMJ ankylosis reported at tertiary health care centre among the general population according to; age, type, cause, treatment and the side involved. Based on the study the mean age of the sample was 17 years which coincides with the studies by Madjidi and Bala^[11-12]. The result was in contrast with He, Ellis and Zhang findings in which the mean age was 23 years^[11-13]. Male to female ratio in the study was 2:1 Based on the study most patients presented with unilateral ankylosis with bilateral ankylosis presenting to lesser degree which coincides with He, *et al.* results and Bala results^[12-13]. A significant female excess confirms the previous hospital-based study^[14] and dissimilar with the studies^[15-16-17] conducted and the study^[15] stated that reason behind males excess is they are subjected more to outdoor activities compare to female. In the present study data on female excess provide groundwork for additional study for the cause behind higher prevalence of ankylosis in girls which could be due to hormonal differentiation between boys and girls or could be related to the differentiation in the anatomy of the neck of the condyle. Because of the advances in the management of condylar fractures and infective conditions in the developed world, the incidence of ankylosis is declining and now is limited to only case reports or series (18, 19 and 20). This study showed 17 patients of TMJ ankylosis within a period of two years. The most common causes of temporomandibular joint ankylosis are trauma (21, 22, 23 and 24), infection (22, 25) and rarely congenital (18, 26, 27). In line with global reports (21, 28), this study found trauma to be the leading causative factor. The aetiologies in this study contrast with those documented by Topazian (24) who found that 43% were due to infection, 38.6% followed trauma and only 2.6% was due to “congenital factors”. The high incidence resulting from trauma is attributable to poor management of condylar fractures, while most of the infective conditions were due to cancrum oris. Otitis media (2.7%) occurring in children is usually as a result of spread of infection from the middle ear canal to the adjacent glenoid fossa/condylar region coupled with poor management of the initial condition. In the series of TMJ ankylosis, bilateral cases were more than the unilateral ones, which is similar to the published hospital-based data^[29] but in the published data^[30-32] unilateral were more. Studies^[33-34] stated that TMJ ankylosis is commonly seen in children and young adults. In the present study most of the patients were in the 7-14 years’ age group. Various hospital-based studies showed that the most prevalent age group presenting with TMJ ankylosis is 6-10 years^[35] and 11-20 years^[36]. The surgical technique used to release the ankylotic mass

following TMJ ankylosis is termed gap arthroplasty, in which an interpositioning material is applied to prevent re-ankylosis. Other techniques, like total joint replacement using costochondria grafts from the ribs, have also been reported^[37]. First reported in 1880 by Abbe^[38], gap arthroplasty involves the removal of a block of bone, leaving a gap between the ascending ramus and temporal bone. Several techniques have been developed to prevent re-ankylosis, which is the greatest concern following TMJ ankylosis release. Using the autogenous temporalis muscle as a myofascial flap has gained acceptance due to its proximity to the surgical site. In our series, when the Bramley-Al-Kayat incision was employed, we used the temporalis fascia or temporalis muscle in four patients as the interpositional material. Distraction osseogenesis (DO) is one of the most popular methods. One of the benefits of DO over orthognathic surgery is the dynamic increase in the mandibular length and height. Also, DO greatly decreases the recurrence of ankylosis. There are other advantages for DO as well, such as a reduced amount of blood loss during the surgery and subsequently, fewer postoperative complications, reduced duration of the surgery, less need for bone harvesting during the surgery, and minimized bone resorption during the recovery time^[39]. Two of the recent cases were operated by DO first approach then ankylotic release.

Conclusion

Ankylosis remains a challenge to the maxillofacial surgeons in the developing world because of poor management of condylar fractures, infections. The study concludes that Birth/childhood trauma was the major causative factor. Initial management of the causative factor was poor. Males are affected more than females. Ankylosis in children leads to facial deformities. Majority of patients presented with bilateral ankylosis. Intracapsular TMJ ankylosis is found to be more prevalent than extracapsular. Coronoidectomy + interpositional arthroplasty with costochondral graft + physiotherapy is the most used protocol for treatment, which lead to improvement in mouth opening with the use of aggressive physiotherapy.

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