

CORRELATION BETWEEN CHILDHOOD CHIN TRAUMA, CONDYLAR FRACTURE & TMJ ANKYLOSIS

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ABSTRACT

The objective of this study was to document the TMJ ankylosis resulting from trauma to the chin during childhood. All patients presenting with TMJ ankylosis at the Oral and Maxillofacial Surgery Department of Mayo Hospital, Lahore from July 2007 to March 2009 were included in this study. Patient's age, sex, socioeconomic status, previous history of injury to the chin (scar mark under the chin), level of health care center initially contacted, initial treatment received at the time of injury were documented.

A total of 180 patients presented with TMJ ankylosis during the study period. 102 (56.7%) were male and 78 (43.3%) were female patients (Male: Female ratio was 1.3:1) with an age range of 4 to 35 years (mean 12.5 years). 174 (96.7%) patients had a scar mark under their Chin. 120 (66.7%) had a history of fall from roof or a tree, 54 (30%) were involved in a road traffic accident, all before the age of 10 years.

Key words: Temporomandibular joint, Ankylosis, Trauma, Mandibular condylar fracture, childhood.

INTRODUCTION

Childhood injuries to chin resulting in mandibular condylar fracture are common but their exact incidence & prevalence in the society have yet to be documented in the literature.¹⁻⁶ Approximately 5% of all types of dental injuries affecting the primary dentition are caused by chin trauma. Falls are the most common cause of mandibular condylar fracture vis-à-vis chin trauma among children below 10 years of age.⁷⁻¹¹

Chin is the most vulnerable part of the body of a falling child, with impact of force transferring indirectly to the weak and highly vascularized pediatric condyle.¹² Condylar fracture must be suspected, if a child presents with a laceration over the chin with a history of fall, it should be noted however, that they can

occur even in the absence of chin laceration due to blunt trauma.^{13,14}

In the absence of any obvious sign, e.g. laceration or dentoalveolar fracture, the condylar fractures in children are often difficult to diagnose.^{15,16} The lack of properly trained medical professional, the difficulty in evaluation and history taking from an agitated child, the trouble in obtaining plane radiographs, the poor quality of radiographs, overlap of multiple anatomic structure of the small pediatric skull and the presence of other more serious injuries in the acute stage elsewhere in the body may add to the difficulty in diagnosis.¹⁷⁻²⁰

Failure to recognize the presence of a condylar fracture may translate into late complications, includ-

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ing facial deformity due to aberrant growth and temporomandibular joint (TMJ) ankylosis. TMJ ankylosis is the most serious complication of condylar fractures. Condylar fractures have been documented to be a leading cause of TMJ ankylosis.²¹⁻²⁶

Ankylosis of the TMJ is a serious and disabling condition. Impairment of speech, difficulty with mastication, rampant caries, poor oral hygiene, disturbances of facial and mandibular growth, and acute compromise of the airway invariably result in physical and psychological disability. The study and correction of TMJ ankylosis are therefore, important to establish proper care for the patient.²⁷⁻³⁰ The aim of this retrospective study was to highlight the correlation between common childhood falls, chin trauma, condylar fracture and TMJ ankylosis.

METHODOLOGY

All patients of TMJ ankylosis presenting for the first time at the Oral and Maxillofacial Surgery Department of Mayo Hospital, Lahore from July 2007 to March 2009 were included in this retrospective study. Patient's age at presentation, sex, income status, literacy level were documented. Presenting complaint, previous history of injury to the chin, cause of the injury and age at the time of initial injury was documented. As most patients and their parents could not recall the exact age at the time of initial injury, they were asked, if injury had occurred at an age less than 5 years, before 10 years of age or between 10 to 15 years of age. History of any associated upper or lower limb fractures, head injuries at the time of initial injury were also documented. Presence or absence of any scar mark under the chin, any deformity of facial skeleton at presentation was observed. Level of health care center initially contacted, initial treatment received at the time of injury were documented.

RESULTS

A total of 180 patients presented with TMJ ankylosis during the study period. 102 (56.7%) were male and 78 (43.3%) were female patients (Male: Female ratio was 1.3:1) with an age range of 4 to 35 years (mean 12.5 years) [Table No. 1].

3(1.7%) patients had history of ear infection while 3(1.7%) patients had other causes, among them one had

ankylosing spondylitis as a known cause of their TMJ ankylosis while in two cases the cause could not be ascertained. 174 (96.7%) patients had history of chin trauma and had an obvious scar mark under their Chin [Table No. 2].

120(66.7%) had a history of fall including fall from roof, a tree, bicycle or standing height, 54(30%) were involved in a road traffic accident [Table No.3], all before the age of 10 years. Out of the 174 patients with scar mark under the chin, 126(70%) patients were initially received at a primary care center, 36(20%) patients were initially received at a secondary care hospital. These 162 (90%) patients initially received only first aid treatment or suturing of the laceration over the chin, as condylar fracture were not addressed or remained undiagnosed. While 12 (6.7%) patients were admitted to a tertiary care hospital, where they received 3-4 weeks of maxillo-mandibular fixation after diagnosis of their condylar fractures (Fig 1). 102(56.7%) patients had trauma to the chin at less than 5 years of age, 72(40%) of the patients had trauma to chin when they were between 5-10 years of age. 33(18.3%) patients had associated upper or lower limb fracture, 12(6.7%) patients had associated maxillofacial bone fracture, 6 (3.3%) had head injuries while 123 (68.3%)

TABLE 1: SHOWS AGE DISTRIBUTION

Age of patient at presentation	Frequency	Percentage
Less than 10 yrs	54	29.9
11-19 yrs	114	63.2
Over 20 yrs	12	6.7

TABLE 2: SHOWS GENDER DISTRIBUTION

Gender	Frequency	Percent
Male	102	56.7
Female	78	43.3
Total	180	100.0

TABLE 3: SHOWS SIDE DISTRIBUTION

TMJ ankylosis	Frequency	Percent
Bilateral	82	45.6
Unilateral Right side	50	27.8
Unilateral Left side	48	26.7
Total	180	100.0

TABLE 4: SHOWS FREQUENCY AND PERCENTAGE OF SCAR MARK UNDER THE CHIN

Scar mark	Frequency	Percent
Present	174	96.7
Absent	6	3.3
Total	180	100.0

TABLE 6: SHOWS CONFIRMED CAUSES OF TMJ ANKYLOSIS

Cause of TMJ Ankylosis	Frequency	Percent
Trauma to chin	174	96.7
Infection	3	1.7
Others	3	1.7
Total	180	100.0

TABLE 5: SHOWS FREQUENCY AND PERCENTAGE OF AGE AT TIME OF INITIAL INJURY

Age at initial injury	Frequency	Percent
Less than 5 years	102	56.7
5-10 years	72	40.0

TABLE 7: GIVES ETIOLOGY OF CHIN TRAUMA

Etiology of chin Trauma	Frequency	Percent
Fall	120	66.7
Road accident	54	30.0
Total	174	96.7

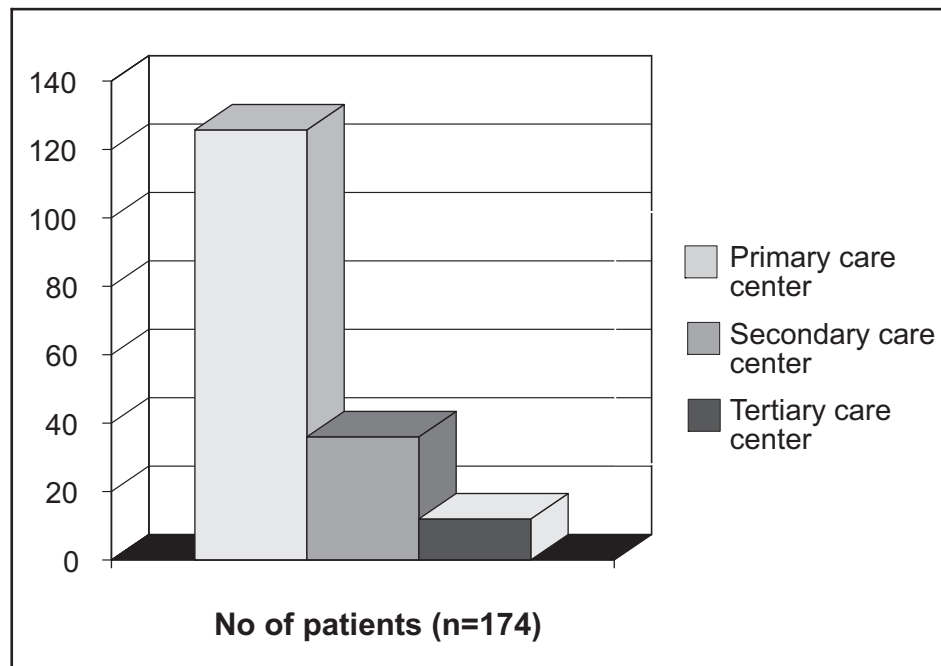


Fig 1: Shows Health care center initially contacted

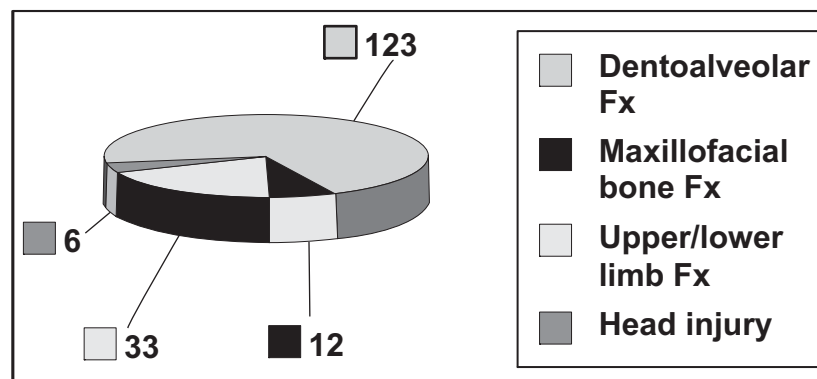


Fig 2: Shows associated Fractures sites

patients had only dentoalveolar injuries associated with lacerations under the chin (Fig 2). 159(88.3%) of the patients belonged to a lower middle class family while 21 (11.7%) were from middle class family. 147(81.7%) of the patients presenting with TMJ ankylosis were uneducated while 33(18.3%) had primary education only as they could not continue further education due to their disability.

DISCUSSION

TMJ ankylosis in children can result most commonly from trauma such as road traffic accidents, falls including falls from a tree, roof top or even standing heights, or as a result of local infections, e.g. local spread of mastoiditis and otitis media and systemic infections like tuberculosis and scarlet fever by the haematogenous route. Ankylosing spondylitis, rheumatoid arthritis and psoriasis may also lead to TMJ ankylosis.^{24,29}

El-Sheikh reviewed 204 patients with TMJ ankylosis treated in the Cranio-Maxillofacial Department of the Alexandria University Hospital during the period 1990–1996, a history of trauma was confirmed in 98% of cases.²⁴ Ansari et al reported trauma (95.7%) as the main cause in 189 patients of temporo-mandibular joint ankylosis reported during 1996 to 2001, at the Maxillofacial unit of Khyber College of Dentistry, University Campus Peshawar.³¹

Holan in 1998 provided data on the prevalence of clinical signs of traumatic injuries to chin and of parental report of such injuries in 303 children (151 boys and 152 girls) visiting a private pediatric dental practice. 79(26%) children had a scar mark on the chin and previous chin injuries were reported for 110 (36.3%). The male to female ratio for scar on the chin and previous trauma were 1.8:1 and 1.5:1 respectively.⁶

In this study it was found that trauma was the most common cause of TMJ ankylosis and was confirmed in 174 (96.7%) patients by an obvious scar mark under their chin and a history of chin trauma at less than 10 years of age. Male: Female ratio in this study was 1.3:1 which is comparable with other studies.

M. Re'mi et al retrospectively studied mandibular fractures in children between March 1994 and January

2001. Falls (bicycle falls in 40% and common falls in 20%) were the first cause of mandibular fractures for a child from 2 to 12 years.³² The condylar region is the most frequently fractured site among the mandibular fractures caused by falls.^{5,20} Chan et al observed that falls, accounted for 53% of all observed and interviewed unintentional residential child injury and 93.5% (2645) injuries caused by 'blunt force' and recommended primary preventive measures such as child proofing of the home environment.¹⁰

In this study it was found that 120(66.7%) of patients with TMJ ankylosis had a history of chin trauma due to a fall including fall from roof, a tree, a bicycle or from standing height.

Jain et al 2008 in a retrospective study of 44 patients in Uttar Pradesh, India presented a broad overview of the management of TMJ ankylosis. TMJ ankylosis was primarily attributed to delay or non-treatment of condylar fractures due to factors such as poor educational levels, non-availability of surgical expertise, and prolonged non-usage of the joint due to pain after injury.³³

Ignored or mismanaged trauma to the joints in growing age is the major cause of TMJ ankylosis occurring in children in Pakistan. The economic status of the patients and unavailability of trained medical specialists have major role in delaying treatment.¹⁸ In our study TMJ ankylosis was result of undiagnosed and untreated condylar fractures in 162 (90%) patients and prolonged immobilization in 12 (6.7%) patients. Majority of the patients (81.7%) presenting with post traumatic TMJ ankylosis were uneducated, lacked self awareness, had poor economic status and had limited access to concerned professional health workers and trained specialist.

The management of pediatric patients with facial injuries requires attention to morphological and physiologic nuance specific to the growing child. Specialized care is required to properly evaluate and treat these injuries.³⁰ Oral and maxillofacial surgeons are specialists trained in diagnosis, treatment and management of both adult and pediatric facial trauma. Unfortunately not all tertiary care hospitals in Pakistan have an operational oral & maxillofacial surgery department providing emergency back up.

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