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Case Series

Management of chronic long standing condyle dislocation

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ABSTRACT

Condyle dislocation accounts for 3% of all the dislocations of different joints in the body. They are basically classified based on duration as acute, chronic and recurrent, the most difficult to manage being chronic longstanding. This study of case series was carried out to enunciate and discuss optimal treatment protocols to enhance the postoperative result and functionally rehabilitate the patient. Data were recorded of patients of chronic long standing condyle dislocation (CLSCD) between 2012 to 2019. Predictor variables were drawn from demographics age, gender, aetiology, duration of dislocation status. The outcome variables were surgical success rate and complications. Surgical treatment included endaural pre auricular approach, high condylar shave with eminoplasty, elastic traction for a period of 5-7 days and mouth opening exercises. 15 patients with CLSCD of more than a month duration were identified out of 65 reported with other forms of acute and recurrent dislocation. The 12 (80%) were bilateral and 3 (20%) were unilateral. Three (20%) were of interpersonal violence, 3 (20%) had cerebrovascular accident, 3 (20%) following RTA with other major injuries, and 1 patient (6.6%) very rare unusual history of dislocation during labor pain reporting after six months. All patients had unsuccessful attempted conservative management. Surgical intervention and outcome were excellent. Complications recorded were 3 patients (20%) had transient facial nerve weakness, 2 (13.3%) infection. Conservative manipulation has definitive role in acute and recurrent cases but surgical approach or open procedure in chronic long-standing cases is the choice with duration of condylar dislocation being the decisive factor for difficulty index.

Keywords: Condyle dislocation, Condylectomy, Eminoplasty, Condylar shave, Subluxation

INTRODUCTION

Temporomandibular joint is a major specialized joint, which is located between the head of the condyle of the mandible and the base of the skull at the temporal bone. The glenoid fossa is the concavity in which the mandible articulates bilaterally. Temporomandibular joint disorders are a collection of disorders, which involve the TMJ articulating surfaces, muscles of mastication and the associated structures, causing discomfort patients. Dislocation of the condyle is a condition in which it is displaced anteriorly beyond the articular eminence from its articulations and which is non self-reducing type and requires intervention to return to its normal position.[1,2] Condyle dislocation accounts for 3% of all the dislocations of different joints in the body and broadly classified as acute, chronic protracted and recurrent.[3,4] It can be unilateral or bilateral and partial (subluxation) or complete (luxation).[4] Based on direction of dislocation it may be superior, posterior and anterior, which is common form. Miller and Murphy classified predisposing factors into six categories: birth related (congenital weakness of articular ligaments), iatrogenic (prolonged dental procedures, traumatic extractions, injudicious use of mouth prop, manipulation under general anesthesia, and improper use of laryngoscope or bronchoscope), trauma,

drug induced (reported with use of reserpine and phenothiazines), physiologic (yawning, sneezing), and systemic (epilepsy, involuntary muscle contraction).[5]

Subluxation of condyle is basically a self-reducing condition whereas acute condyle dislocation is a term used when the condyle slides anterior to the articular eminence, and or gets displaced superiorly or other direction and needs intervention either by non-surgical or surgical means. Repeated episodes of dislocations is termed as recurrent and a chronic is a long standing one where the condyle remains in a dislocated position out of glenoid fossa for more than a month to variable duration till its recognized.[6] The aetiology of the displacement is multifactorial such as morphology of condyle, glenoid fossa, eminence, zygomatic arch and squamotympanic fissure.[6] Long-standing term is the applicable to those dislocated condyle where it has lasted for longer than a month.[6]

The stand out presentation of the condition is an anxious and disturbed patient. They clinically have inability to close the mouth i.e., "open lock" condition, (Figure 2) difficulty in speech, drooling saliva and incompetent lips. The basic difference between acute and chronic condition is association of pain in preauricular region in acute conditions which is missing in chronic as patient is adapted to the condition. Deviation of chin towards the contralateral side in unilateral, skeletal class III appearance in bilateral and emptiness in the joint space in the preauricular region on palpation are some of the other clinical features.[7]

There is varied surgical treatment for CLSCD from minimal invasive to various anchoring, blocking and combination of both but for CLSCD the role of conservative high condylectomy and eminoplasty with its success rate and complications are studied in this paper.

CASE SERIES

Data was collected from the medical records of patients with surgical intervention between 2012 to 2019. Sixty-five patients were reported with condylar dislocation, out of which 15 (23.7%) were CLSCD. The inclusion criteria was duration of dislocated state for more than one month. Acute and recurrent and patients with associated fractures of condyle or other facial bones and patients who were lost for follow up were excluded.

Assessment of the case records included demography with history, duration and clinical findings. Conventional radiographs orthopantomogram (Figure 7) and posterior anterior view of mandible, CT scan of face with 3-D reconstruction.

Standard surgical protocol was under general anaesthesia, endaural pre-auricular approach, high condylar head shave (3 to 5 mm) and Eminoplasty to achieve the anatomic repositioning of condyle in the glenoid fossa along with intermaxillary fixation and elastic traction for a week followed by aggressive physiotherapy for six months postoperatively (Figure 4-6).

Treatment outcome variables were assessed for pain, facial symmetry, mouth opening, range of mandibular movements, facial nerve injury and infection.

Figure 1: Pre-operative frontal profile patient with long standing, dislocation of bilateral condyle.

Figure 2: Showing premature contact of posterior teeth with resultant anterior open bite.

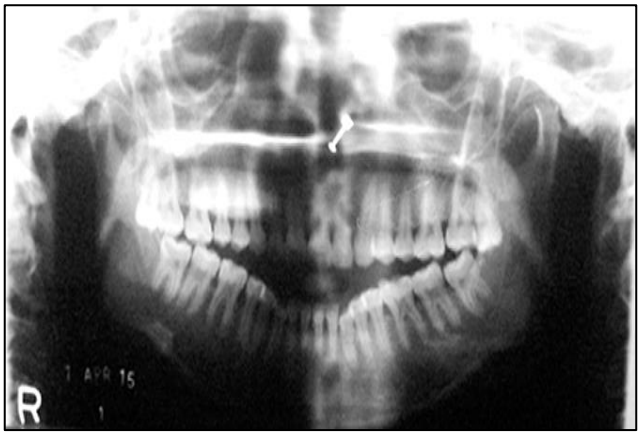

Figure 3: Preoperative orthopantomogram showing bilateral anteriorly dislocated condyle.

Figure 4: Surgical markings of landmarks for preauricular incision.

The 10 (66.6%) females and 5 (33.3%) males were part of study, youngest was 18 years and the oldest 56 years. The average age of the patients was 36.6 years. All the patients reported after more than one month to six months, following the incidence. The 12 (80%) were bilateral and 3 (20%) unilateral. Five patients (33.3%) were partially or completely edentulous, 3 (20%) gave history of interpersonal violence, 3 (20%) had cerebrovascular accident, 3 (20%) reported following road traffic accident (RTA) with other major injuries, and 1 patient (6.6%) presented with a very rare history of bilateral dislocation during labour pain which was not noticed for six months.

The pain assessment was done using visual analog scale (VAS) preoperatively and postoperatively. Spontaneous pain was evaluated by using (0 to 10) VAS scale. The left endpoint of the scale indicated no pain at all, and the right endpoint indicated the worst pain imaginable. Maximum comfortable mouth opening (MCO) and maximum assisted mouth opening (MAO) were recorded for each patient. Eight (53.3%) of the fifteen patients were satisfied by the pain reduction during the 1st week. Seven patients (47.6%) felt a decline in the pain and continued to do till the second follow up, which was after 21 days. The elastic traction was maintained intermittently with analgesic and muscle relaxant combination (Figure 6). Post operatively OPG assessment was done to check the condyle position (Figure 7).

All the patients had reversal of their facial asymmetry (Figure 8) with mild deviation of mandible in unlateral cases in the follow up phase. None of the patients had episodes of dislocation in the follow-up period (Table 1).

Postoperative physiotherapy was initiated after one week with mandibular opening and lateral movements. There was a significant increase from the static preoperative mouth opening range of 2-2.5 cm to a range of 3.5-3.7 cm during the one year follow up period (Figure 9) (Table 2).

Two patients (15.5%) developed infection at the surgical site, which was managed with appropriate intravenous antibiotics and regular dressings after culture and sensitivity tests while two patients (15.5%) had developed temporary facial nerve paralysis, which resolved within six months.

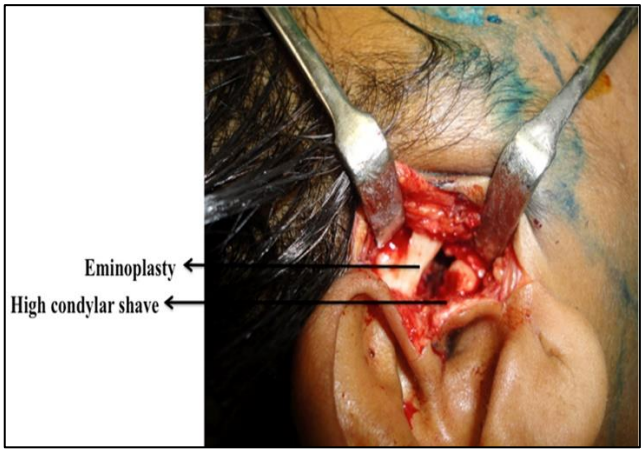

Figure 5: High condylar shave and eminoplasty done bilaterally.

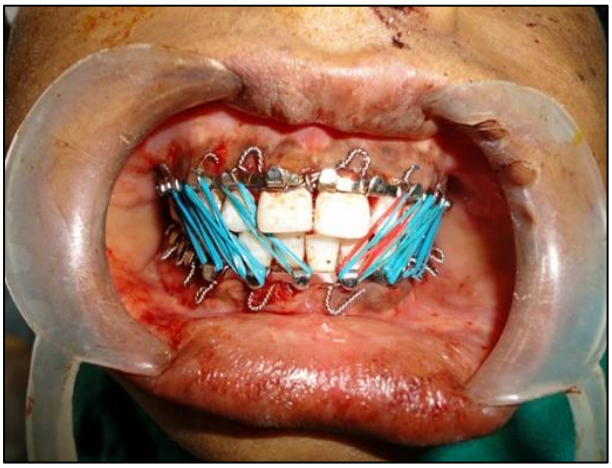

Figure 6: Intermaxillary fixation using light force elastics.

Figure 7: Postoperative orthopantomogram showing condyles in normal position of glenoid fossa.

Figure 8: Post operative frontal profile of the patient.

Figure 9: 5 years follow up of improved mouth opening.

Table 1: Patient details with pre and postoperative VAS assessment showing significant improvement.

Age/ sex (Years)	Etiology	Type of dislocation	Duration of dislocation (weeks)	VAS score (Pre-op) (0-10) scale	VAS score (Postop) (0-10) scale	Follow up period VAS (1 week)	Follow up period VAS (4 weeks)
35/F	Road traffic accident	Bilateral	4	8	7	3	2
46/M	Completely edentulous (no history of trauma/ dislocation)	Bilateral	6	8	8	3	1
18/F	Road traffic accident	Bilateral	7	7	6	2	2 (Facial nerve paralysis)
25/F	Post labour	Bilateral	24	9	7	5	3
43/F	Interpersonal violence	Unilateral	6	8	7	2	1
34/M	Road traffic accident	Bilateral	12	6	6	1	1
44/F	Partially edentulous (no history of trauma/ dislocation)	Unilateral	4	9	8	7	4 (Infection)
56/F	Completely edentulous (no history of trauma/ dislocation)	Bilateral	4	9	8	4	2
38/M	Cerebrovascular accident	Bilateral	24	7	6	1	1
24/M	Partially edentulous (no history of trauma/ dislocation)	Bilateral	6	9	8	2	1
39/F	Cerebrovascular accident	Bilateral	18	8	8	6	3
35/M	Interpersonal violence	Unilateral	5	9	7	7	3 (Infection)
32/F	Interpersonal violence	Bilateral	4	9	8	6	2
35/F	Cerebrovascular accident	Bilateral	10	7	7	6	1
46/F	Completely edentulous (no history of trauma/ dislocation)	Bilateral	6	8	6	5	3 (Facial nerve paralysis)

Table 2: Preoperative and postoperative assessment of mouth opening of patients.

Patient no.	Mouth opening (cm)	Follow up 1 week (cm)		Follow up 4 weeks (cm)		Follow up 12 weeks (cm)	
	Pre op	MCO	MAO	MCO	MAO	MCO	MAO
1	2.0	2.8	3.0	3.2	3.5	3.5	3.7
2	2.2	2.8	3.1	3.5	3.7	3.6	3.7
3	2.1	2.9	3.0	3.2	3.5	3.5	3.7
4	2.5	2.7	3.3	3.4	3.5	3.5	3.7
5	2.2	2.9	3.2	3.3	3.4	3.5	3.7
6	2.0	2.8	3.2	3.3	3.4	3.5	3.7
7	2.0	2.9	3.0	3.2	3.5	3.6	3.8
8	2.0	2.7	3.0	3.2	3.5	3.5	3.6
9	2.4	3.0	3.2	3.3	3.5	3.5	3.7
10	2.1	2.8	3.0	3.2	3.5	3.5	3.6
11	2.1	2.8	3.0	3.2	3.5	3.5	3.7
12	2.2	2.8	3.0	3.2	3.5	3.5	3.7
13	2.3	2.9	3.0	3.2	3.3	3.5	3.7
14	2.4	2.6	2.8	3.2	3.5	3.6	3.7
15	2.1	2.9	3.0	3.2	3.5	3.5	3.7

MCO: Maximum comfortable mouth opening, MAO: Maximum assisted mouth opening.

DISCUSSION

Various factors have been implicated as etiological agents responsible for mandibular dislocation including yawning, drugs, anesthetic procedures, trauma, fall, seizures, muscular dyskinesias and certain connective tissue disorders.[8] The predisposing factors put forth by Miller and Murphy play a significant role in developing chronic condyle dislocation.[5] Extrapyramidal side effects have been prevalent in psychiatric patients treated with phenothiazines, haloperidol and thiothixene.[8] Patton (1982) put forth the theory of psychogenic subluxation leading to dyskinesia of the muscles attached to condylar head.[9] Systemic causes which can be considered for the same are diseases such as Ehlers-Danlos syndrome, Parkinson's disease or neurological diseases.[10]

The Hippocratic maneuver of movements of the mandible in downward and backward is still the most favored method for reducing an acute dislocation, however, this method has been modified over the years to accommodate a quicker instant relief without much struggle, such as Lewis in 1981, who suggested to place thumbs over the occlusal surface of lower molars while others suggested to place it over the anterior border of ramus.[1,11-13] A simpler method was put forth by Awang in 1987 who suggested inducing gag reflex by probing the soft palate and creating a reflex neuromuscular action leading to reduction.[12,14]

Recurrent condyle dislocation is a self-reducing, which the patient is able to close his mouth without assistance whereas chronic long standing is a condition in which the condyle is completely displaced from its articulation for a period of more than six weeks and requires surgery.[8] Akinbami in 2011 gave a new classification based upon the relationship of the head of the condyle articular eminence as seen radiologically.[4] Type I head of condyle is directly below the tip of the eminence, type II it is in front of the tip of the eminence and in type III it is high up in front of the base of the eminence.

All conservative management as suggested in literature have no role in long standing cases.[15-18] Another conservative modality put forth by Littler in 1980 includes injecting local anesthetic agent in long standing dislocations to relax the muscle spasms caused due to pain.[19] The concept of injecting Botulinum toxin A (BTX-A) has revolutionized the treatment of mandibular dislocations in more than one way. It works on the principle of causing temporary weakness and atrophy of lateral pterygoid muscle by blocking the release of acetylcholine from nerve endings (Martínez-Pérez D).[20-22] Because the effect is temporary, it needs to administered every 2 weeks for 2-3 months for better results. In 1968, Rowe and Killey, used a method of placing a bone hook over the sigmoid notch through an incision below the angle of mandible and giving a downward traction, followed by traction wires being placed through the holes drilled in the angle of mandible.[8,15] Lewis carried out a technique similar to Gilles temporal approach and applied downward and posterior force using Bristow's elevator to carry out reduction of the condyle into the glenoid fossa.[13] Some authors believe that there are chances of articular cartilage and joint destruction due to restricting mandibular movements using head bandages or IMF with arch bars but Alons et al reported there is no significant damage to the disc and cartilage and suggested aggressive mouth opening exercises within 2 weeks of IMF.[23,24]

Surgical methods often take front row in managing CLSD once conservative treatments fail. Main goal is to keep in mind while carrying out surgical intervention are to reduce condyle into position, bring teeth into occlusion and prevent recurrence of dislocation. Various methods like condylotomy, modified condylotomy, myotomy, menisectomy, meniscoplasties etc have been tried over ages but none have been able to produce satisfactory

results. Myrhaug in 1951 was first to introduce the concept of eminectomy and Leclerc in 1943 described the obstruction of condylar path by downward displacement of Zygomatic arch, which was later modified by Dautery in 1975.[25] Laskin in 1973 advocated temporalis myotomy via intraoral approach using coronoid approach.[23]

In the recent times, surgical resections (eminectomy) and augmentations (eminoplasty) of the articular eminence have gained popularity and have been widely accepted. Complete eminectomy of the articular eminence helps in returning the condyle back to the glenoid fossa without any interference.[25] Augmentation of the eminence with autogenous bone grafts such as calvarial or iliac bone grafts are helpful in creating a barrier for the condyle.[6] Materials miniplates, mini-implants, L-shaped pins, silicone wedge blocks and hydroxyapatite blocks are helpful in augmenting the eminence. For long standing dislocation midline mandibulotomy and algorithm was proposed by Lee et al and Rattan et al but the efficacy of technique is difficult to judge with few cases. Choice of open surgical intervention should aim at restoring the condyle back in position with minimum morphological changes and restoring the symmetry and function.[26-28]

A total joint replacement and orthognathic surgery should be considered as one of the last resort options after the above-mentioned treatments have failed in chronic recurrent and long-standing dislocations.[28]

In contrast to most of the procedures mentioned, we preferred a minimum invasive method to contour the eminence and conservative high condyle shave (3 to 5 mm) in order to give a smooth curved anatomy without disturbing the architecture. All patients were satisfied by the postoperative results and none of them had any recurrent episodes of dislocation.

CONCLUSION

CLSCDs (more than a month) are rare and can be very disturbing for the patients. Non-surgical modality does not produce desired result thus surgical intervention helps in providing relief to the agony without any complications. As the etiological factors vary, diagnosis and evaluation of each case is a must to decide upon the intervention. Long standing chronic dislocation necessitates surgical intervention with minimum architectural changes in TMJ. Difficulty index for surgery is proportional to duration of condylar dislocation.

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