Case Report

Post-traumatic superolateral temporo-mandibular dislocation with intact condyle: case series and literature review

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Abstract – Introduction: Supero-lateral temporomandibular dislocations with intact condyles are very rare, particularly in countries of sub-Saharan Africa where they are poorly documented. **Materials and method:** This was a retrospective study that included all patients received for superolateral temporomandibular dislocation with intact condyle following a maxillofacial trauma. The period covered by the study was from January 2011 to July 2021. **Results:** 3 patients were studied. According the classification of temporomandibular superolateral dislocation with intact condyle, the first patient had a Type II A, the second and the third patient, type II B. The manual reduction of the first patient luxation was unstable requiring an osteosynthesis of mandibular symphysis to stabilise the reduction of the temporomandibular dislocation. The second patient manual reduction was unsuccessful requiring an open reduction by preauricular approach. The third left against medical advice. **Discussion:** The occurrence of temporomandibular superolateral dislocation with intact condyle in an underdeveloped city like Bouaké, is not related to the density of road traffic but to the indiscipline of the many motorcyclists who do not wear helmets. Early reduction of the dislocation, early mobilisation of the joint and mechanotherapy positively influence the postoperative outcome.

Introduction

Temporomandibular dislocation is a dislodgement of the head of the mandibular condyle from its normal position in the glenoid fossa [1]. Temporomandibular dislocations can be classified into different types depending on the direction taken by the condyles out of the glenoid cavity [2]. There are 4 groups of temporomandibular dislocation: anterior, posterior, superior and lateral [3]. They mainly occur during mandibular trauma with high kinetics [2]. The present study focuses entirely on post-traumatic superolateral temporomandibular dislocation (SLTMD) with intact condyle which is very rare [2]. Indeed, Srinath *et al.* had recorded, from 1969 to 2016, a total of 17 publications documenting only 28 cases of superolateral dislocation of the intact condyle [4]. Several classifications have been proposed. However, the one which seems to be the most exhaustive is that proposed by Sharma *et al.* (Tab. I) [5]. The international literature of the past 10 years, explored

for the development of this study, revealed that no publication on this subject has been identified in South Saharan Africa (Tab. II) [6]. This study reports 3 cases of TMSLD with intact condyle. This work, will allow to shed light on the explanatory factors and the clinical and therapeutic particularities of this pathology in an underdeveloped country.

Materials and method

This was a retrospective study that included. The case series was collected from patients admitted to maxillofacial trauma emergencies. This study was carried out in compliance with the conditions laid down in the Declaration of Helsinki. A literature review was performed using the keywords "superolateral, dislocation and temporomandibular". Google Scholar and HINARI databases were used. The literature review covered a period from January 2011 to December 2020 and the data collection period was from January 2021 to July 2021. All patients with superolateral temporomandibular dislocation with intact condyle following a maxillofacial trauma were included in the study.

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Table I. Classification of supero-lateral temporomandibular dislocations with intact condyle.

Type	Sub types et description
I	Latéral subluxation Complete dislocation with associated fracture of anterior mandible
II	A Condyle not hooked above the zygomatic arch
	B Condyle hooked above the zygomatic arch
	C Condyle lodged within the zygomatic arch which is fractured
III	Complete dislocation without associated fracture of anterior mandible
	A Condyle not hooked above the zygomatic arch
	B Condyle hooked above the zygomatic arch
IV	C Condyle lodged within the zygomatic arch which is fractured
	Complete dislocation without associated maxillo-mandibular fractures
	A Condyle not hooked above the zygomatic arch
	B Condyle hooked above the zygomatic arch
	C Condyle hooked at the level of zygomatic arch

Fig. 1. CT scan of patient one showing Bilateral superolateral dislocations (yellow arrow) with intact condyle and zygomatic arch.

The data collected were epidemiological (place, year, age, sex), clinical (trauma, type of dislocation) and therapeutic (type of reduction and evolution after treatment).

Results

Case series

Observation 1

A 33-year-old man, a motorcyclist not wearing a helmet, was admitted with maxillofacial trauma following a road traffic accident. He reportedly fell from a motorcycle he was riding and landed face down. Clinical examination revealed painful bilateral swelling of the pretragial regions and a linear wound measuring 5 cm in length in the chin area. There was also pain associated with abnormal mobility of the mandible with

retained labial-chin tenderness. Maxillofacial CT (computed tomography) scan revealed a complex fracture of the mandibular symphysis with a third fragment associated with bilateral superior condylar dislocations. Both condyles were below the zygomatic arch (Fig. 1). It was a Type II A of classification of SLTMD with intact condyle. On the 7th of hospitalization, a reduction in temporomandibular dislocations was performed by external bi-manual pressure under general anesthesia. But this reduction was unstable. The condyles were therefore maintained in their glenoid cavity by an assistant while the osteosynthesis of the mandibular symphysis by a mini plate and a maxi plate was performed. An intermaxillary fixation using rubber band was performed for 10 days. The patient presented a mouth opening limitation of 10 mm, which was improved by mechanotherapy until a mouth opening of

Fig. 2. CT scan and clinical picture of patient 2 showing right superolateral temporomandibular dislocation (yellow arrow), mandibular retrusion (red and white arrow) and chin wound (blue arrow).

Fig. 3. Operative pretragial approach and CT scan of patient 2 showing right mandibular condyle dislocation with articular capsule ruptured (yellow arrow) and post operative condyle position after reduction (white arrow).

30 mm was achieved after one week. The patient was seen 6 months later and presented no functional complaints.

Observation 2

A 35-year-old man, motorcyclist patient not wearing a helmet, suffered a maxillofacial trauma following a road traffic accident. He would have fallen from the bike he was riding and

landed face down. Clinical examination revealed painful unilateral right pretragial swelling, a linear chin wound measuring 2 cm, abnormal mobility of the mandible (Fig. 2). The maxillofacial CT scan performed revealed a fracture of the mandibular symphysis associated with a right unilateral superolateral dislocation of the mandible with intact condyle. The condyle was impacted above the zygomatic arch which was intact (Fig. 2). It was a type II B of classification of SLTMD

Fig. 4. CT scan of patient 3 showing right superolateral temporomandibular dislocation with complexe maxillofacial fractures.

with intact condyle. On the 9th days of hospitalization, reduction of the TM dislocation was attempted by an external maneuver, under general anesthesia. It was unsuccessful. An open reduction by preauricular approach was therefore performed (Fig. 3). An osteosynthesis of the mandibular symphysis by mini plate was also made. The control scanner showed a good reduction of the dislocation (Fig. 3). An intermaxillary fixation using metal wire was performed for 10 days and then rubber band for 20 days. The patient had a mouth opening of 30 mm was achieved after 3 weeks. The patient was seen 6 months later and no functional complaints were observed.

Observation 3

A 27-year-old man, a motorcyclist not wearing a helmet, was admitted for craniofacial trauma following a traffic road accident. He reportedly fell from the bike he was riding with landing face down. Clinical examination noted global swelling of the face, a transfixing wound of the lower lip and chin, with exposure and abnormal mobility of the mandible. The CT scan performed revealed a right superolateral temporomandibular dislocation with intact condyle. This dislocation was associated with a fracture of the mandibular symphysis with overlapping displacement, a Lefort I fracture and a fracture of the left zygomatic bone (Fig. 4). It was a type II B of classification of

SLTMD with intact condyle. The patient, having no health insurance, could not afford the costs for the surgery. He therefore left against medical advice.

Literature review

Of the 16 publications reviewed, 12 (75%) were Indian (Tab. II) [1,3–17]. 30 patients were involved with a mean age of 31.87 years. In 15 cases (50%), the dislocations were bilateral. Out of a total of 45 dislocations, 26 (57.78%) were on the left side and type II of the TMSLD classification (Tab. I) was observed 34 times (75.55%). The average treatment time was 11.78 days (Tab. II) [1,3–17].

Discussion

The existence of chin wounds in 2 cases and chin associated to lower lip in one case gives an idea of the site of facial landing. This seems to correspond to the injury scenario proposed by Debelmas *et al.* This scenario suggests an open parasymphyseal fracture leading to a widening of the transverse dimension of the mandible allowing lateral displacement of the two condyles [2]. However Sharma *et al.*, in her work described a case of lateral dislocation in which there was no associated mandible fracture [5]. Most of the cases identified have been in industrialized countries where road traffic is denser. Our

Table II. Review of the littérature of superolateral temporo-mandibular dislocation with intact condyle.

Authors, Years	Country	Age (years)/Sex	Type and side	Mec	TD (Day)	Method of Reduction
Prabhakar <i>et al.</i> 2011 [7]	India	47/ F	Left II and Right II	Fall	45	Open
Amaral <i>et al.</i> 2015 [8]	Brazil	15/F	Left IIB	RTA	1	Closed
Radakrishna <i>et al.</i> 2013 [9]	India	50/M	Left IIC	RTA	05	Closed
Shen <i>et al.</i> 2013 [3]	China	40/M	Left IIB	RTA	04	Closed
Kim <i>et al.</i> 2013 [10]	Korea	54/M	Left I and Right IIB	RTA	04	Closed
Singh <i>et al.</i> 2013 [11]	India	22/M	Left IIA and Right IIB	RTA	02	Closed
Saraswathi <i>et al.</i> 2013 [12]	India	8/F	Left IIB	Fall	US	Closed
		33/M	Left IIB	Fall	07	Closed
		25/M	Left I and Right I	RTA	07	Closed
Mishra <i>et al.</i> 2015 [13]	India	28/F	Right I	US	07	Open
		25/M	Right IIA	RTA	07	Closed
		30/M	Left IIB and Right IIB	RTA	07	Closed
Saikrishna <i>et al.</i> 2016 [14]	India	41/M	Left IIB	RTA	07	Open
		25/M	Left IIB and Right IIB	Fall	02	Closed
Patil <i>et al.</i> 2016 [15]	India	14/F	Left IIB and Right IIB	RTA	04	Closed
		32/M	Left IIB and Right IIB	RTA	03	Closed
Sharma <i>et al.</i> 2017 [1]	India	30/M	Left IIB	RTA	20	Open
Srinath <i>et al.</i> 2017 [4]	India	48/F	Right IIA	Fall	04	Closed
		40/M	Left IIA	RTA	03	Closed
		32/M	Left I and Right IIB	RTA	05	Closed
		11/F	Left I and Right IIA	RTA	05	Closed
Bhutia <i>et al.</i> 2017 [16]	India	35/M	Right IIA	RTA	09	Closed
		30/M	Left IIC	RTA	04	Closed
		32/M	Left I and Right IIA	RTA	09	Closed
		60/M	Left I and Right I	RTA	09	Closed
		28/M	Left I and Right I	RTA	07	Closed
Hira <i>et al.</i> 2018 [6]	South Africa	24/M	Left IIB	RTA	57	Open
		27/M	Left IIA	RTA	74	Open
Sharma <i>et al.</i> 2019 [17]	India	35/M	Left IIB and Right IIB	RTA	US	Closed
Sharma <i>et al.</i> 2020 [5]	India	35/M	Left IIA and Right IIA	RTA	US	Closed

M = Masculine; F = Feminine; RTA = road traffic accident; TD = Treatment Delay; Mec = Mechanism; US = Unspecified.

environment is renowned for the frequency of motorcycle accidents in which users are characterized by an absolute disregard for individual road safety measures such as wearing helmet [18]. The temporal bone's articular surface and the head of the mandible, enclosed in a fibrous capsule which is one of the elements of stability of tempomandibular Joints (TMJ). In addition, this stability is also ensured by three major ligaments, temporomandibular, stylomandibular, and sphenomandibular ligaments. Trauma or abuse can cause inflammation or injuries of

the synovial tissues (synovitis) and the capsular ligament (capsulitis). With the consequence of an alteration of the stability of TMJ [19]. This pathophysiological presentation sheds light the importance of the capsular ligament condition in the instability of reductions in superolateral dislocation. These reduction difficulties in our cases could be also explained by the time taken to care of more than 7 days in both cases. These delays in care are relatively frequent due to limited local financial resources [18]. However, failures of reductions have also been

reported in the literature [17]. Early mobilization of the temporomandibular joint and mechanotherapy seemed to provide good results in the 2 operated cases. This therapeutic attitude is shared by Debelmas *et al.* who tend to use early rehabilitation rather than prolonged rigid maxillo-mandibular blockage [2]. Therapeutic care would also have been a new challenge for local surgeons. However, the socio-economic conditions of the patient led him to leave against medical advice.

Conclusion

Superolateral temporomandibular dislocation with intact condyle is rare. Therapeutic management is not codified and calls for the creativity of the maxillofacial surgeons. These surgical experiences are valuable to the scientific community. This is the place to raise awareness of local authorities in order to deepen their actions in the direction of better social security, especially for the most disadvantaged patients.

Conflict of interest

The authors declare that they have no conflict of interest.

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Ethical committee approval

The authors declare that Ethical approval not required.

Informed consent

This article does not contain any studies involving human subjects.

Author's contributions

GE Crezoit: Conceptualization, Methodology, EM Djémi: Writing original draft. PIJ Béréte: Visualization, Investigation. ARE Yapo: Visualization, Investigation. B Illi: Supervision. NEK Zegbeh: Writing- Reviewing and Editing.

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