



ORIGINAL PAPERS

Traumatic dislocation of the trapeziometacarpal joint

Juan Castellanos* and Luis Veras del Monte

Department of Orthopedic and Trauma Surgery, Sant Boi de Llobregat Hospital, Barcelona, Spain

Received April 14, 2008; accepted November 4, 2008

Available on the internet from July 9, 2009

KEYWORDS

Acute dislocation;
Trapeziometacarpal
joint;
Conservative
management

Abstract

Purpose: To assess the results of the use of conservative treatment, consisting of closed reduction followed by scaphoid-type forearm cast immobilization, to treat acute dislocations of the trapeziometacarpal joint.

Materials and methods: Seven patients were treated, 4 males and 3 females, who had suffered an acute traumatic dislocation of the trapeziometacarpal joint.

All patients were subjected to closed reduction followed by immobilization with a scaphoid-type forearm cast for a period of 6 weeks. In 2 cases additional stabilization was required by means of K-wires. Mean follow-up was 36–79 months.

Results: Results were satisfactory in all patients. At the last follow-up visit none of them presented with symptoms, nor any residual dislocations were observed radiographically. All patients went back to their pre-accident activities.

Discussion: Trapeziometacarpal dislocations are an unusual occurrence. Closed reduction followed by immobilization (combined with K-wires in cases of residual instability further to reduction) offers satisfactory results.

© 2008 SECOT. Published by Elsevier España, S.L. All rights reserved.

PALABRAS CLAVE

Luxación aguda;
Articulación
trapeziometacarpiana;
Tratamiento
conservador

Luxación traumática de la articulación trapeziometacarpiana

Resumen

Objetivo: Evaluar los resultados obtenidos al tratar de forma conservadora (mediante reducción cerrada seguida de inmovilización con un yeso antebraquial de escafoides) las luxaciones agudas de la articulación trapeziometacarpiana (ATM).

Material y método: Se trató a 7 sujetos (4 varones y 3 mujeres) afectados de luxación aguda traumática de la ATM. A todos los sujetos se les realizó reducción cerrada e inmovilización con un yeso antebraquial tipo escafoides por un período de 6 semanas. En 2

* Corresponding author.

E-mail: 20744jcr@comb.es (J. Castellanos).

casos fue necesario estabilización adicional mediante agujas de Kirschner. El período de seguimiento ha sido de 36 a 79 meses.

Resultados: Los resultados fueron satisfactorios en todos los sujetos, ninguno presentaba sintomatología o subluxación residual en los estudios radiográficos en el último control. Todos los sujetos retornaron a su actividad previa al accidente.

Discusión: Las luxaciones trapeciometacarpianas son lesiones infrecuentes. La reducción cerrada seguida de inmovilización (combinada con agujas de Kirschner en aquellos casos de inestabilidad residual tras la reducción) ofrece resultados satisfactorios.

© 2008 SECOT. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Introduction

Trapeziometacarpal (TMC) joint dislocation is a rare injury, which has only been studied in short series¹⁻⁶. On some occasions it is associated to avulsions of the base of the first metacarpal or of the trapezium^{3,5}. It is often an easily reducible dislocation, but it tends to remain unstable following reduction^{1,3,5,7}.

There is a certain amount of controversy as to what should be the treatment of choice. Some authors advocate conservative treatment by means of closed reduction and forearm cast immobilization and Kirschner wires if necessary^{2,5,6}, other authors prefer surgical ligament repair in order to minimize the risk of instability^{3,4,8,9}. In this series we present the results obtained following conservative treatment.

Materials and methods

In the period between 1997 and 2003, 7 subjects that had sustained a traumatic dislocation of the TMC Joint were treated in our hospital. The series included 4 males and 3 females aged between 15 and 46 years. The mechanism of injury was a car accident in 5 subjects, a fortuitous fall in one subject and a basketball accident in one subject. All dislocations were closed; in one case there was a concomitant avulsion of the trapezium (figs. 1 and 2) and in another the dislocation also included the base of the first metacarpal.

All subjects were treated the same day of the accident by closed reduction followed by application of a forearm cast that included the thumb. In 2 subjects the use of additional Kirschner wires was necessary because of post-reduction instability. Length of immobilization was 6 weeks.

Follow up was between 36 and 79 months. The final result was satisfactory in all subjects, none of whom presented with pain or residual instability. Moreover, the last follow-up x-rays did not reveal degenerative changes, subluxation or residual instability. All subjects were able to return to their pre-trauma activities.

Discussion

TMC joint dislocation is a rare injury. There is some controversy regarding the mechanism of injury, the

capsuloligamentous structures that get injured, the degree of residual instability following reduction and last but not least about what should be the treatment of choice.

The most common mechanism of injury is a force applied onto the metacarpal axis while the TMC joint is flexed^{3,7}. The second mechanism that has been suggested is a shear force applied from the web space (proposed by Monsche and cited by Toupin et al⁵).

The TMC joint is a biconcave-convex saddle joint whose stability is provided anteriorly by the anterior oblique carpometacarpal ligament, dorsally by the posterior oblique ligament, laterally by the radial carpometacarpal ligament and medially by the anterior intermetacarpal ligament.

According to Eaton and Littler^{10,11} the anterior oblique ligament reinforced by an expansion of the anterior annular carpal ligament is the main stabilizer of the TMC joint. Other authors attribute this function to the intermetacarpal



Figure 1 A/ Pradiograph: trapeziometacarpal joint dislocation associated to a bony avulsion of the trapezium.



Figure 2 A/P radiograph: same case as in figure 1 following reduction: the joint is congruent.

ligament^{4,12,13}. The observations made following surgery^{1,3,5} as well as the cadáver studies carried out indicate that it is the dorsoradial ligamentous structures that prevent the TMC Joint from dislocating, so that injury to the other capsuloligamentous structures (with a preserved dorsoradial ligament) could provoke some degree of instability but not a complete dislocation of the joint.

Although a TMC joint dislocation is easily reducible, it has traditionally been considered an unstable condition^{1,3,7}. Nevertheless, some Publications report full joint stability following reduction². In our series, the reduction was considered stable in 5 of the 7 cases.

As regards the treatment of choice, there is no agreement among the different authors. Some of them advocate forearm cast immobilization², whereas others prefer temporary fixation with Kirschner wires plus a plaster cast^{1,2,5}. Finally, other authors prefer open reduction and joint stabilization through ligament repair^{3,4,9}.

Watt and Hopper² treated 9 of their 12 subjects only with as forearm cast and obtained 67% good results (6 subjects were asymptomatic). In our series, we obtained an excellent result in all 5 subjects treated in this way. Toupin et al⁵ carried out a literature review comparing the results obtained in subjects treated with reduction and stabilization with Kirschner wires plus a plaster cast (16 subjects) versus

subjects treated by means of open reduction and ligament repair (14 subjects). They found no significant differences between both groups. Therefore they concluded that closed reduction followed by stabilization with Kirschner wires plus a plaster cast could be the treatment of choice.

The authors of the present study, in line with Watt and Hopper², consider that the most important factor in the treatment of cute TMC joint dislocations is to assess the degree of stability afforded by closed reduction. Furthermore, they consider that dislocations considered stable following reduction must be immobilized with a forearm cast including the thumb and those where instability is observed following reduction, which entails a risk of redislocation, should be temporarily fixed with one or 2 Kirschner wires. Finally, the authors also relieve that surgical ligament repair should be reserved for cases of late symptomatic instability and for inveterate dislocations.

Conflict of interests

The authors have declared that they have no conflict of interests.

References

1. Shah J, Patel M. Dislocation of the carpometacarpal joint of the thumb. *Clin Orthop*. 1983;175:166-9.
2. Watt N, Hooper G. Dislocation of the trapezio-metacarpal joint. *J Hand Surg*. 1987;12:242-5.
3. Péquignot JP, Giordano Ph, Boatier C, Allieu Y. Luxation traumatique de la trapézo-mé'tacarpienne. *Ann Chir Main*. 1988;7:14-24.
4. Fontes D. Intérêt d'une ligamentoplastie précoce dans les entorses graves de l'articulation trapézo-metacarpienne. À propos de 10 cas. *Acta Orthop Belg*. 1992;58:48-59.
5. Toupin JM, Milliez PY, Thomine JM. Luxation trapézomé'tacarpienne post-traumatique récente. A propos de 8 cas. *Rev Chir Orthop*. 1995;81:27-34.
6. Khan AM, Ryan MG, Teplitz GA. Bilateral carpometacarpal dislocations of the thumb. *Am J Orthop*. 2003;32(1):38-41.
7. Green DP, Rowland SA. CMC joint of the thumb. En: Rockwood, editor. *Green's fractures in adults*. 3a ed. Philadelphia: J B Lippincott Company; 1991. p. 540-2.
8. Eaton RG. Joint injuries of the hand. Springfield, Charles C. Thomas; 1971. 66.
9. Pandriamananjara NFR, Fchat F. À propos de la luxation trapézo-métacarpienne récidivante traitée par ligamentoplastie active du court extenseur. *Acta Orthop Belg*. 1985;51:110-7.
10. Eaton RG, Littler JW. Ligament reconstruction for the painful thumb carpometacarpal joint. *J Bone Joint Surg A*. 1973; 55:1655-66.
11. Littler JW. Trapeziometacarpal joints injuries. *Hand Clinics*. 1992;8:701-11.
12. Kuckzinsky K. Carpometacarpal joint of the human thumb. *J Anat*. 1974;19:119-26.
13. Pagalidis T, Kuckzinsky K, Lamb DW. Ligamentous stability of the base of the thumb. *Hand*. 1981;13:29-35.