Spontaneous Thumb CMC Joint Dislocation in Long- Standing Anorexia Nervosa

Ronit Wollstein · Yaron Zaulan · Fadi Hazan ·
Benjamin Bernfeld · Gabriel Anatol

Received: 8 May 2013 / Accepted: 7 February 2014 / Published online: 20 February 2014
© Society of the Hand & Microsurgeons of India 2014

Keywords Anorexia nervosa · CMC joint · Dislocation · Thumb

Introduction

Patients with anorexia nervosa exhibit a wide variety of physical signs and symptoms that require treatment including effects on the musculoskeletal system. Atrophy and change in type of skeletal muscle, changes in bone density with pathological fractures and skin changes have been described [1–3].

We describe a spontaneous, unreduced thumb carpometacarpal (CMC) joint dislocation in a patient suffering from long standing anorexia nervosa. The patient was treated with excision of the trapezium and tendon suspension and interposition arthroplasty with a good result.

Case Report

A 41 year old female felt a “pop” in her right thumb while lifting a teapot, after which the area of the thumb CMC joint became swollen and painful. She was seen in the emergency room where

a reduction of the thumb CMC joint was performed and the thumb was splinted. The splint was removed after 6 weeks at which time it became clear that a reduction had not been maintained. She continued using the thumb though she felt loss of normal strength, and movement of the thumb was uncomfortable. Five months later she presented for the first time [4] to the hand clinic with a painful weak thumb that precluded normal function of the right hand. On examination, the thumb was shortened and the CMC joint was unstable and painful. Radiographs revealed a dislocated thumb CMC joint. Figure 1

Past medical history and review of symptoms was significant for a 29 year history of anorexia nervosa (from the age of 12 years) with numerous complications related to the condition over the years including bilateral leg cellulitis, diaphragmatic hernia with reflux esophagitis and dysphagia. The patient weighed 77 lb at a height of 5 ft (body mass index (BMI) of 15). She had been diagnosed with chronic hyponatremia, vitamin B12 deficiency with macrocytic anemia, hypoalbuminemia, and osteomalacia, serum albumin measurements were between 2.2 and 3.5 g/l.

The patient was insistent that the pain and lack of function was severe enough to warrant surgery despite understanding the risks of surgery in her malnourished state. Due to the chronicity of the lesion, and the presumed suboptimal condition of her soft tissues, it was decided that reduction and fixation would not be sufficient and that either a thumb CMC joint fusion or a tendon arthroplasty should be performed. There was significant concern over the adequacy of the soft tissues and the ability to heal a fusion. After discussion with the patient it was decided to perform a trapeziectomy and tendon arthroplasty using $\frac{1}{2}$ of the flexor carpi radialis (FCR) tendon.

The patient was operated on under general anesthesia. The thumb CMC joint was approached through a dorsal incision and the joint inspected and found to be dislocated with severe thinning and wear of the cartilage. The surgical technique consisted of removal of the trapezium and suspension of the

R. Wollstein
Department of Plastic and Reconstructive Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA

R. Wollstein
Department of Orthopedic Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA

R. Wollstein · Y. Zaulan · F. Hazan · B. Bernfeld · G. Anatol
Department of Orthopedic Surgery, Division of Hand and Upper Extremity Surgery, Carmel, Lady Davis Medical Center, Haifa, Israel

R. Wollstein (✉)
3550 Terrace St., Pittsburgh, PA 15261, USA
e-mail: ronitwollstein@gmail.com

Fig. 1 Radiographs showing continued dislocation despite splinting

first metacarpal through a drill hole in the base using the ulnar $\frac{1}{2}$ of the FCR tendon. The tendon was harvested through two transverse incisions one at the proximal wrist crease and one at the musculotendinous junction. The remaining harvested tendon was wound around the intact $\frac{1}{2}$ of the FCR and then sewn to itself as an interposition. On gross examination the tendons were of good quality though the bone was very soft. Nylon sutures (nonabsorbable) were used in the suspension as well

Fig. 2 **a** and **b**: PA and lateral radiographs (respectively) a year after surgery with trapezial excision and interposition and suspension arthroplasty. Some subsidence can be seen but the joint remains pain free and with full range of motion

as to close the capsule and skin thinking that healing would possibly be prolonged.

After surgery the patient was splinted for 4 weeks in a thumb spica splint. She complained of large amounts of clear fluid discharge from all of the wounds and some erythema around the sutures. She also complained of a constant pain in the area. On examination there was no evidence of infection at any stage. There were no areas of tenderness and the patient had good thumb range of motion. The discharge and erythema gradually improved and at 10 weeks post surgery the patient had well healed wounds and no pain as well as good range of motion and function. Figure 2

Discussion

Adult patients with long-standing anorexia nervosa are infrequently seen in the hand clinic. We describe a rare phenomenon of spontaneous thumb CMC joint dislocation in such a patient that was treated surgically with a good result, though following a prolonged postoperative course.

Thumb CMC joint dislocations are generally rare. This is most likely due not only to the anatomic characteristics of the joint (resilience of the bony and ligamentous structures as well as good muscular protection) but also to the position of the thumb necessary for the forces to create a dislocation [5]. Spontaneous thumb CMC joint dislocations are even more uncommon. Therefore it is reasonable to assume that in order for a spontaneous dislocation to occur, either an anatomic predisposition or significant weakness of the soft tissue stabilizers of the joint must exist [6]. We did not find any references describing dislocations associated with anorexia or malnutrition, nor did we find references directly examining the quality of the ligamentous structures in anorexia nervosa. However, muscular weakness has been described in anorexia and multiple studies have described soft tissue weakness in malnutrition. Furthermore when specifically addressing stability of the thumb CMC joint, the muscles in addition to the ligaments may play an important part. We consequently think it is reasonable that the malnutrition associated with the disease may allow for “easier” dislocation than in individuals without long standing anorexia and malnutrition [7–9].

Had we treated this condition initially and assuming the reduction was not stable, we would have attempted open reduction and repair of the ligaments, likely with temporary internal fixation. However, since the patient presented with an already chronic dislocation (5 months), a salvage type surgery was deemed necessary and the question was whether to perform a CMC joint fusion or a trapeziectomy with a ligament reconstruction as was ultimately performed. It is possible that trying to obtain fusion would have been more difficult in this patient due to the malnutrition.

When treating patients with anorexia, the hand surgeon should take into account the possible condition of the soft tissues as well as the osteomalacia in these patients. The soft

tissue incompetence may be significant enough to allow rare dislocations to occur spontaneously, and a simple reduction, may not succeed as demonstrated in our case.

Not only the integrity of the soft tissues, but also their ability to heal, should be taken into account [4, 10]. Our patient manifested with a prolonged healing time and serous discharge over weeks. Furthermore she suffered unexplained pain in the area of surgery longer than in the same surgery performed on a healthy adult. The good final result is encouraging so that we think surgery should not be contraindicated, but the unique constellation of soft tissue defects should be taken into account when planning, executing and following up these patients.

References

1. Essen B, Fohlin L, Thoren C, Saltin B (1981) Skeletal muscle fibre types and sizes in anorexia nervosa patients. *Clin physiol* 1:395–403
2. Alloway R, Reynolds EH, Spargo E, Russell GF (1985) Neuropathy and myopathy in two patients with anorexia and bulimia nervosa. *J Neurol Neurosurg Psychiatry* 48:1015–1020
3. Biller BM, Saxe V, Herzog DB, Rosenthal DI, Holzman S, Klibanski A (1989) Mechanisms of osteoporosis in adult and adolescent women with anorexia nervosa. *J Clin Endocrinol Metab* 68:548–554
4. Ng MF (2010) Cachexia - an intrinsic factor in wound healing. *Int Wound J* 7:107–113
5. Cavlak Y, Kindel H (1984) Dislocation of the thumb saddle joint. *Unfallchirurgie* 10:211–212
6. Gamble JG, Mochizuki C, Rinsky LA (1989) Trapeziometacarpal abnormalities in Ehlers-Danlos syndrome. *J Hand Surg* 14:89–94
7. Mobargha N, Ludwig C, Ladd AL, Hagert E (2013) Ultrastructure and Innervation of Thumb Carpometacarpal Ligaments in Surgical Patients With Osteoarthritis. *Clin Orthop Relat Res* 6:13 doi:10.1007/s11999-013-3083-7
8. Ladd AL, Weiss AP, Crisco JJ, Hagert E, Wolf JM, Glickel SZ, Yao J (2013) The thumb carpometacarpal joint: anatomy, hormones, and biomechanics. *Instr Course Lect* 62:165–179
9. Neumann DA, Bielefeld T (2003) The carpometacarpal joint of the thumb: stability, deformity, and therapeutic intervention. *J Orthop Sports Phys Ther* 33:386–399
10. Strumia R (2005) Dermatologic signs in patients with eating disorders. *Am J Clin Dermatol* 6:165–173