Case report

Ceramic trapezio-metacarpal arthroplasty: Probably half is better than full

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ABSTRACT

Trapezio-metacarpal arthroplasty is one of the several treatment options available for painful first carpo-metacarpal (CMC) osteoarthritis of hand. In India, we have only Moje ceramic implants available for CMC arthroplasty. Although the literature cites high frequency of loosening and failure with use of Moje ceramic prostheses, all these studies describe results with total carpometacarpal arthroplasty. We expected that hemi-arthroplasty alone, by virtue of trapezium preservation leading to optimal capsular and ligament tensioning will provide good outcome.

We wish to present first case of long-term successful outcome of Moje hemi trapezio-metacarpal arthroplasty from India as well as internationally.

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1. Introduction

Trapezio-metacarpal arthroplasty is one of the several treatment options available for painful first carpo-metacarpal (CMC) osteoarthritis of hand. Although several types of implants like silicone, metallic like cobalt-chrome, pyro carbon, and ceramic are available internationally, only ceramic ones (Moje™) are available in India.

Although the literature cites high frequency of loosening and failure with use of Moje ceramic prostheses,^{1,2} all these studies describe results with total carpometacarpal arthroplasty. We could not find any literature regarding outcome of ceramic hemi trapezio-metacarpal arthroplasty. We wish to present the first case of long-term successful outcome of Moje hemi trapezio-metacarpal arthroplasty from India as well as internationally.

2. Case report

A 49-year-old female presented to us with complaints of pain and stiffness at the base of right thumb with severe restriction of movements for last 12–18 months. On examination, first carpo-metacarpal joint was tender and attempted movements were

painful and were associated with crepitation. CMC grind test was positive. Her X-rays (Fig. 1) revealed stage III arthritis as per Eaton–Littler staging.³ She had failed trial of many therapeutic modalities in the past including physiotherapy, NSAID, cold and heat therapy, and splinting. She was offered surgical treatment and all options including various soft tissue procedures, resection arthroplasty, trapezium excision, and implant arthroplasty were discussed. The patient opted for implant arthroplasty and since scapho-trapezio-trapezoid (STT) joint was uninvolved and only ceramic ones are available in India, we made a shared decision for Moje ceramic hemi trapezio-metacarpal arthroplasty (Fig. 2).

3. Surgical technique

The patient was placed in supine position under general anesthesia and the hand was placed on a side table with tourniquet and esmarch bandage control. A dorso-radial incision measuring 4 cm was used centered upon first CMC joint. Care was taken to protect superficial branch of radial nerve (Fig. 3). Capsule of CMC joint was cut and the joint was exposed. A straight osteotomy of first metacarpal was done 4 mm proximal to articular cartilage and osteophytes were removed. A wire was inserted in the center of metacarpal under image control. A reamer and cutting expander was used to make space for stem of implant (Fig. 4). Similarly, a K wire was placed in the center of trapezium and with a rose-head cutter, distal surface of trapezium was made concave to receive the implant head (Fig. 5). The implant was placed in a cementless

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Fig. 1. Preoperative X-rays showing stage III arthritis as per Eaton–Littler staging with osteophytes and slight joint space narrowing.

Fig. 2. Moje ceramic hemi-TMC prosthesis.

Fig. 3. Superficial branch of radial nerve should be identified and protected.

Fig. 4. Preparation of first metacarpal.

Fig. 5. Preparation of trapezium.

fashion and stability was checked in all directions (Fig. 6). Capsule was closed and the wound was closed in layers.

4. Follow-up

A thumb spica slab was given for 2 weeks and both slab and stitches were removed on day 14. The patient was put on intermittent thumb spica splint and was started on physiotherapy. At 3 months follow-up, the patient had gained full movement without pain. At 50 months follow-up, the patient was asymptomatic and had good pinch and grasp strength (Fig. 7). There was no evidence of any loosening on X-rays at final follow-up (Fig. 8).

5. Discussion

Thumb carpometacarpal (CMC) osteoarthritis is an incapacitating disorder affecting approximately 11% and 33% of men and women respectively. It usually affects people in 5th decade of life.

Fig. 6. Final prosthesis insertion.

Both conservative and surgical options have been described for its treatment. Various surgical options like osteotomy, trapezial excision, beak ligament reconstruction with or without tendon interposition (LRTI), and implant arthroplasty with or without trapezial excision have been described by various authors in literature.⁴

While the soft tissue procedures have been described for Eaton stage II–IV, they are more useful in early stages. In advanced stage, implant arthroplasty is more likely to provide better results. Also, arthroplasty has been shown to have better short-term results than trapeziectomy with LRTI.⁵

CMC prostheses come in various materials and sizes. Silicon implants are not used nowadays because of high incidence of prosthesis subluxation, fracture, and silicone synovitis. Various newly developed implants like Artelon interposition arthroplasties have shown poor results. Various metal total joint arthroplasties have been developed and a few recent designs have been reported

Fig. 7. Excellent function at 50 months follow-up.

Fig. 8. Postoperative X-rays at final follow-up, with good integration of implant and no evidence of loosening.

to have good outcomes. Various types of pyrocarbon arthroplasty have also been developed; however, early results are conflicting.⁶

In India, we have only Moje ceramic implants available for CMC arthroplasty. Although the literature cites high frequency of loosening and failure with use of Moje ceramic prostheses,^{1,2} all these studies describe results with total carpometacarpal arthroplasty. Our case represents the long-term successful result of Moje ceramic hemi trapezio-metacarpal arthroplasty. This better outcome of hemi-arthroplasty may be the result of trapezium preservation leading to optimal capsular and ligament tensioning as well as stabilization.

Viewing at multiple treatment options described for CMC joint osteoarthritis and still with no proven better treatment method, this ceramic hemi trapezio-metacarpal arthroplasty may be a useful alternative, especially in Indian context. However, before making any recommendation, we need studies with large number of cases as well as with better study designs including randomized trials.

Conflicts of interest

The authors have none to declare.

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