

Arthroscopic Thumb Carpometacarpal

Chapter 24 Interposition Arthroplasty

Introduction

Osteoarthritis in the thumb carpometacarpal (CMC) joint is a common condition, especially in women over 60 years of age. Various treatment approaches are currently being used, including fusion, prosthesis, and trapeziectomy, with or without ligament reconstruction. The outcomes are generally good with these methods, but problems persist. In the early stages of moderate osteoarthritis and normal alignment, arthroscopic interposition arthroplasty makes sense. It is straightforward for the patient and does not burn any bridges if another procedure is needed later on.

Operative Technique

Patient Preparation and Positioning

The procedure is performed under regional anesthesia. The patient's arm is secured to the arm board. Traction is placed on the thumb using a finger trap. Only 2 to 3 kg of counterweight is needed.

Exploration of the Thumb Carpometacarpal Joint

A needle is used to locate the 1 palmar (1P) portal, which is in front of the first compartment (abductor pollicis longus and extensor pollicis brevis). This portal is located at the palmar–dorsal skin junction of the hand, or even slightly in front on the volar side (Fig. 24.1). The terminal branches of the radial nerve are not a concern at this level. This portal can be enlarged as needed to accommodate the implant. The joint is identified with hemostats, and the sheath and arthroscope are inserted. Direct entry is possible because this joint is not concave as is the wrist joint. A standard 2.4 mm scope is used, although some prefer to use a smaller (1.9 mm) scope. Based on our experience, this smaller, more fragile scope is not necessary. The second portal (1 dorsal [1D]) is located using a needle and the scope's transillumination feature; this portal is positioned behind the first compartment (Fig. 24.2a, b). The shaver is inserted through this portal.



Fig. 24.1 Intraoperative view of a needle being used to locate the 1 palmar (1P) portal in front of the first compartment.

Debridement of the Thumb Carpometacarpal Joint

The thumb CMC joint is usually filled with inflamed synovial tissue. As a consequence, the first step is a synovectomy with the shaver (Fig. 24.3a–c). The shaver and scope positions can be reversed to finish the synovectomy. In some patients, the joint will contain foreign bodies that are free-floating or partially attached to the capsule. These must be completely removed (Fig. 24.4).

Osteophyte Resection

Regardless of implant type, every single trapezium osteophyte must be resected. The medial osteophyte

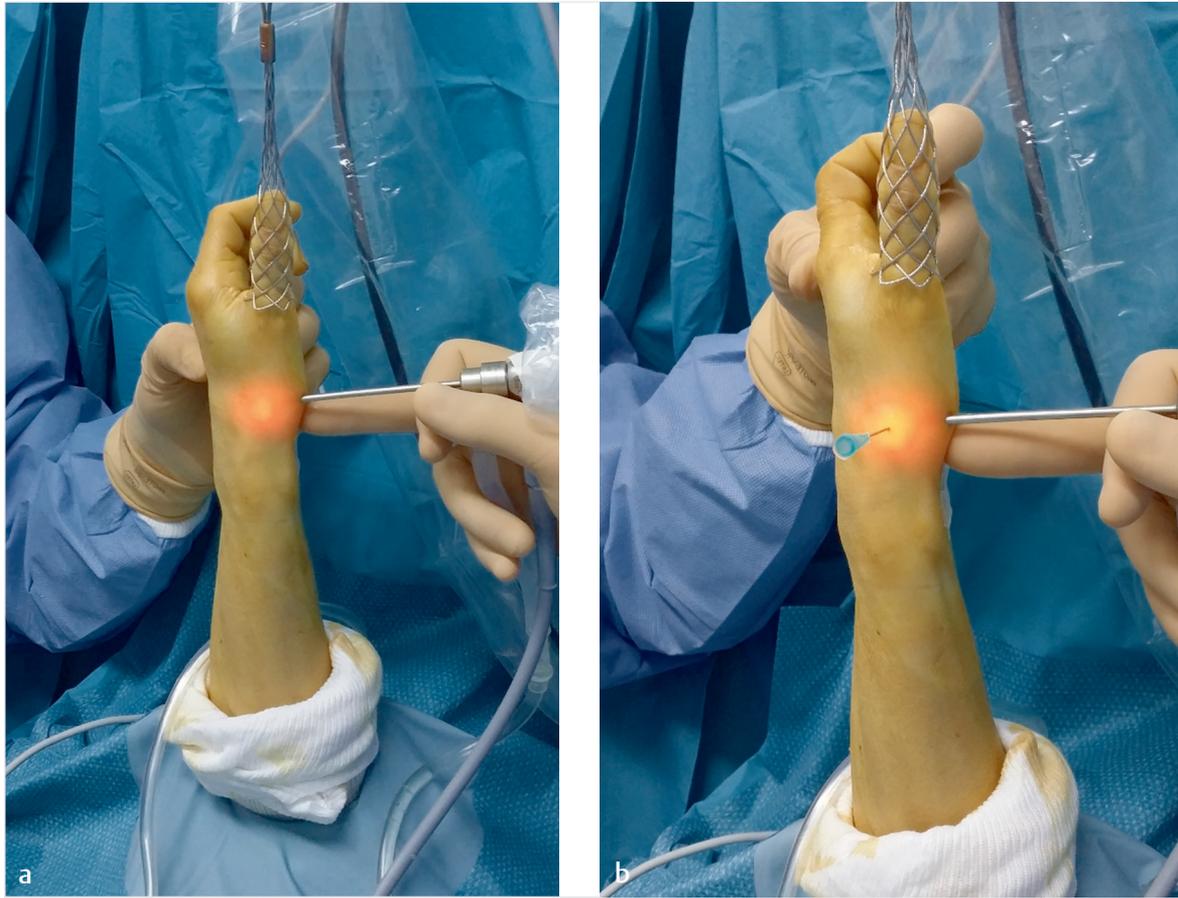


Fig. 24.2a, b Intraoperative views of the 1 dorsal (1D) portal being located using the scope's transillumination feature.

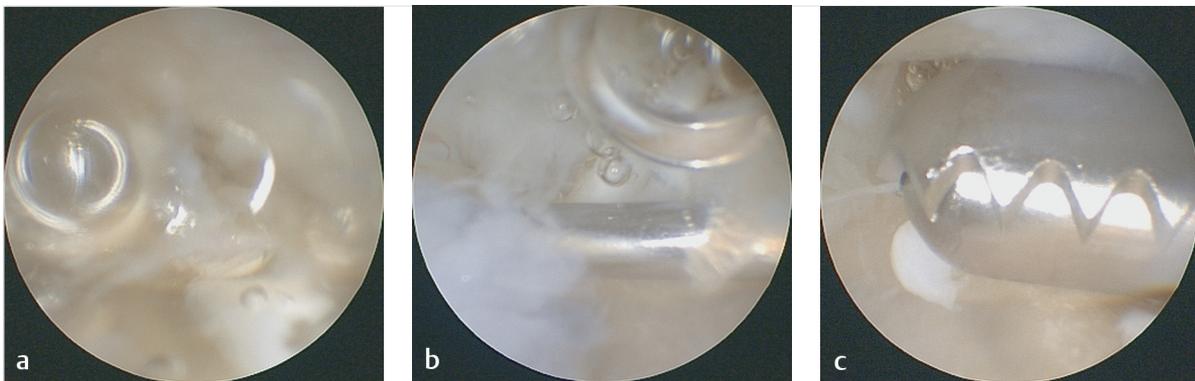


Fig. 24.3a–c
a Arthroscopic view of the visibility being significantly hampered by extensive synovitis.
b Shaver being used to debride the joint.
c The joint after full debridement.

is removed first with the scope in 1D and the bur in 1P (Figs. 24.5a–c and 24.6a–c). The bur and scope positions are reversed to resect a lateral osteophyte (Fig. 24.7a, b).

A pyrocarbon implant may require resection of the volar and dorsal osteophytes at the base of the first metacarpal as well.



Fig. 24.4 Arthroscopic view of an intra-articular foreign body being removed.

Placement of Implant

The implant insertion technique depends on the type of implant used for the interposition arthroplasty.

Pyrocarbon Interpositional Spacer

For both arthroscopic and open surgery, enough space must be created in the joint to accommodate the implant. The four osteophytes are resected first, as described in the previous step. A graduated probe is used to determine the implant size. The 1P portal will need to be enlarged to 1 cm. The joint capsule is opened with hemostats, using the same technique. The chosen implant is then either pushed or pulled into the joint, and the scope is used to verify its position (**Figs. 24.8, 24.9, 24.10a–f**).

Poly lactide Implant or Tendon Graft

A third portal (pure palmar) must be created to insert a poly lactide implant or tendon graft. The scope remains in the 1P portal. A blunt trocar guide is inserted into

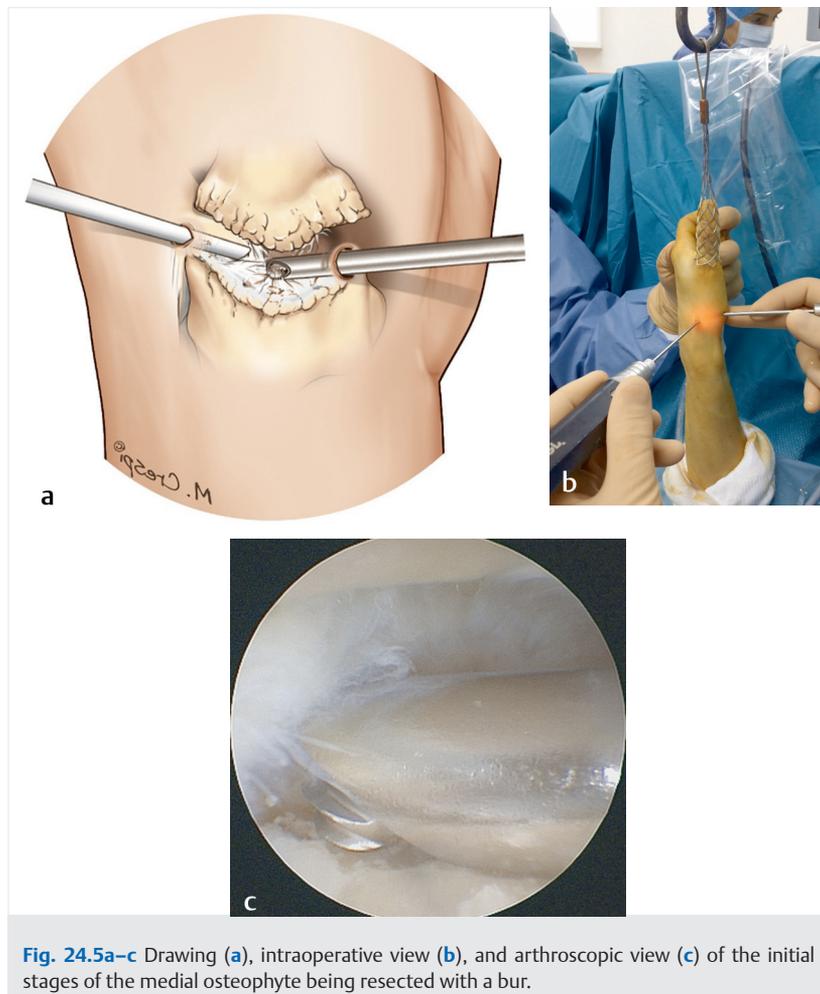


Fig. 24.5a–c Drawing (a), intraoperative view (b), and arthroscopic view (c) of the initial stages of the medial osteophyte being resected with a bur.

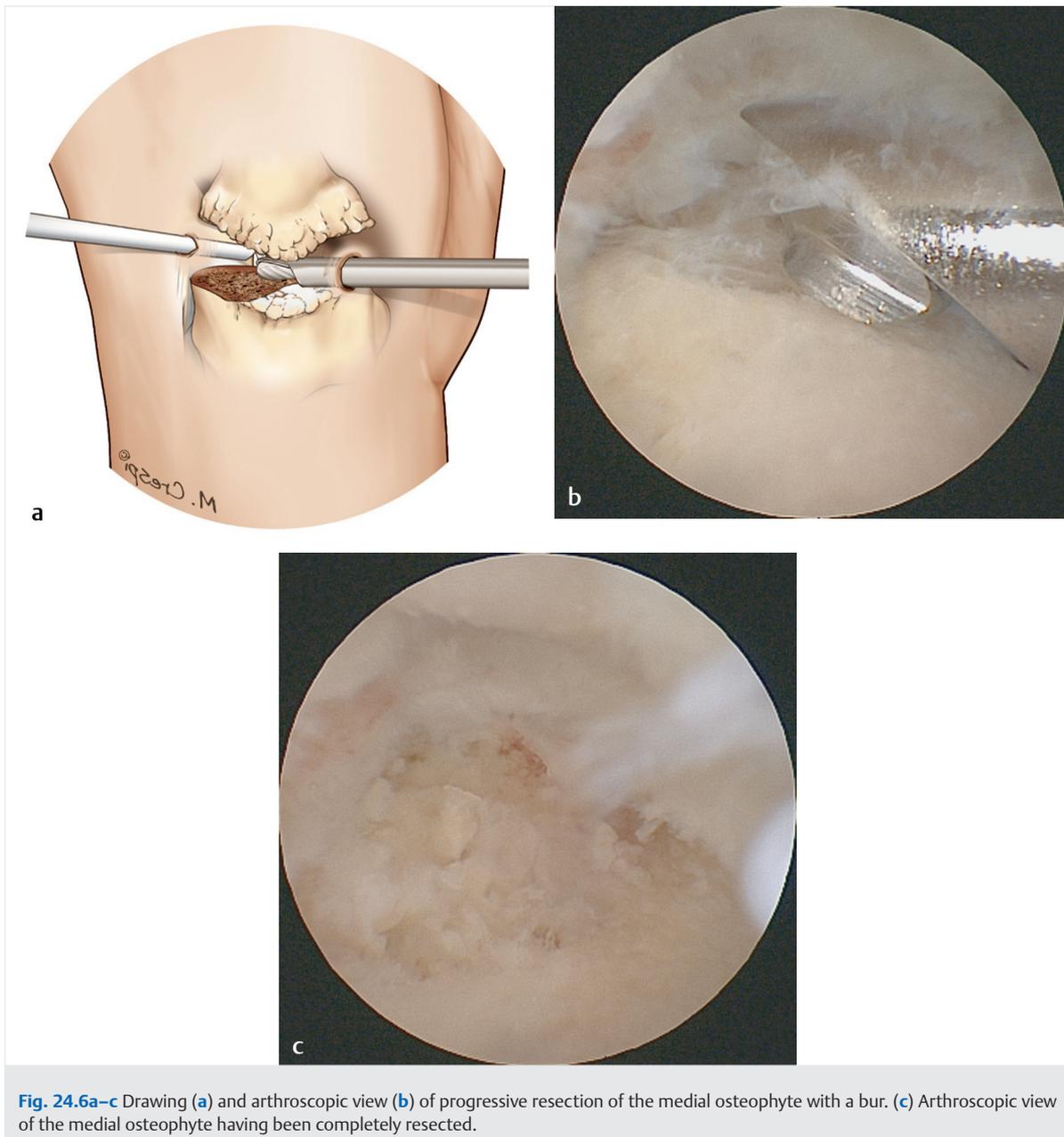


Fig. 24.6a–c Drawing (a) and arthroscopic view (b) of progressive resection of the medial osteophyte with a bur. (c) Arthroscopic view of the medial osteophyte having been completely resected.

the 1D portal and then pushed through the joint until it reaches the volar side of the thenar eminence. A horizontal incision is made at this point (Fig. 24.11a–c). The guide is replaced by forceps (preferably straight ones) that will exit through this pure palmar incision. The forceps are used to grab the implant and pull it inside the joint under arthroscopic control (Fig. 24.12). The implant automatically stabilizes itself (Fig. 24.13a–d).

Closure and Postoperative Care

If a pyrocarbon implant was used, the capsule is closed with one cross-stitch of resorbable suture, and the 1P skin incision is also closed with suture. In the other patients, as is typical, the horizontal incisions do not need to be closed because simple wound healing prevents scarring. A thumb abduction splint is used for about 1 month before starting rehabilitation.

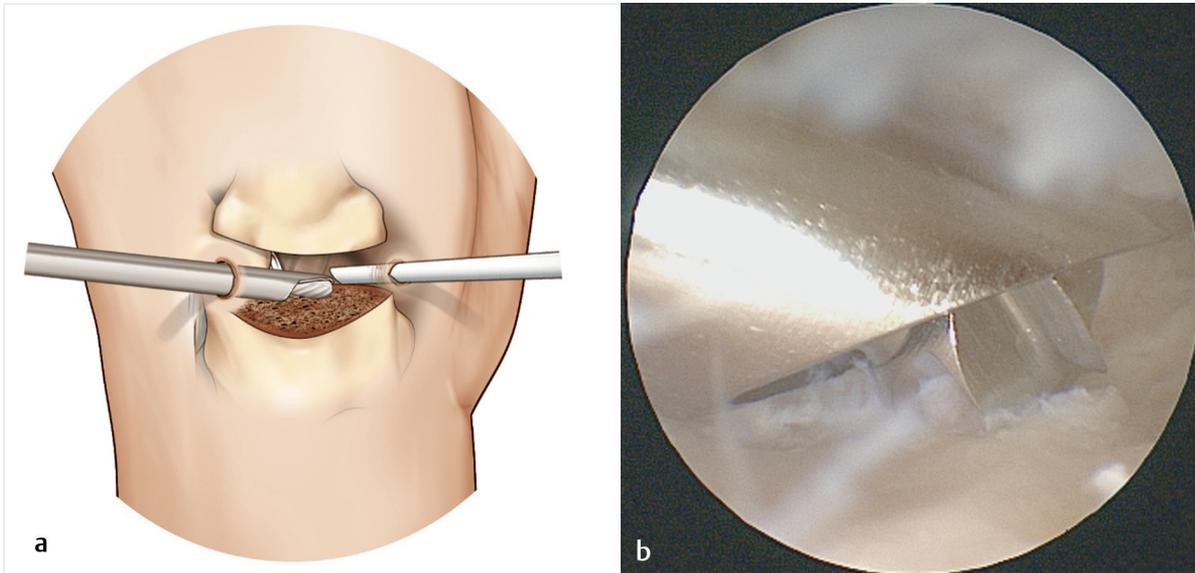


Fig. 24.7a, b Drawing (a) and arthroscopic view (b) of the distal end of the trapezium being completely resected after the scope and bur positions have been reversed.

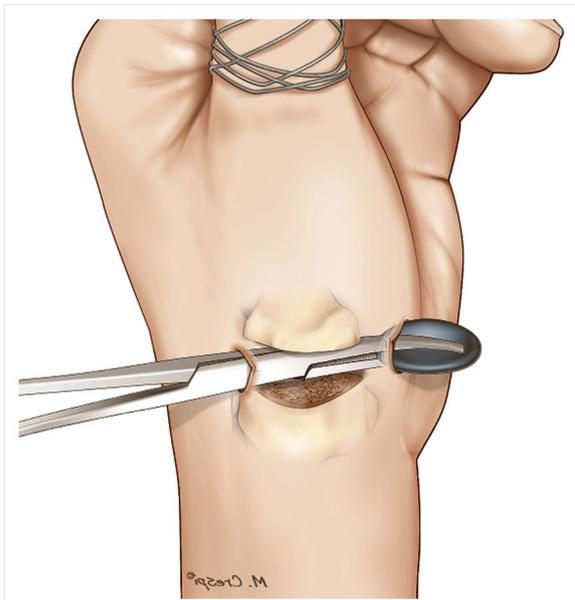


Fig. 24.8 Drawing of one of the methods used to insert the implant through a slightly enlarged 1P portal incision.

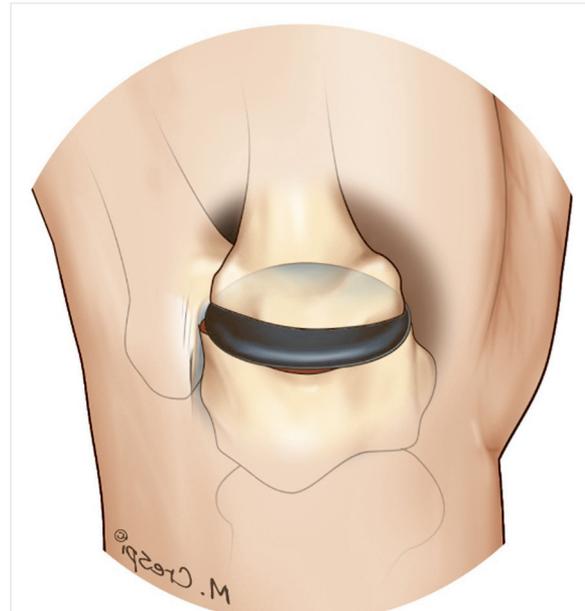


Fig. 24.9 Drawing of the seated implant.

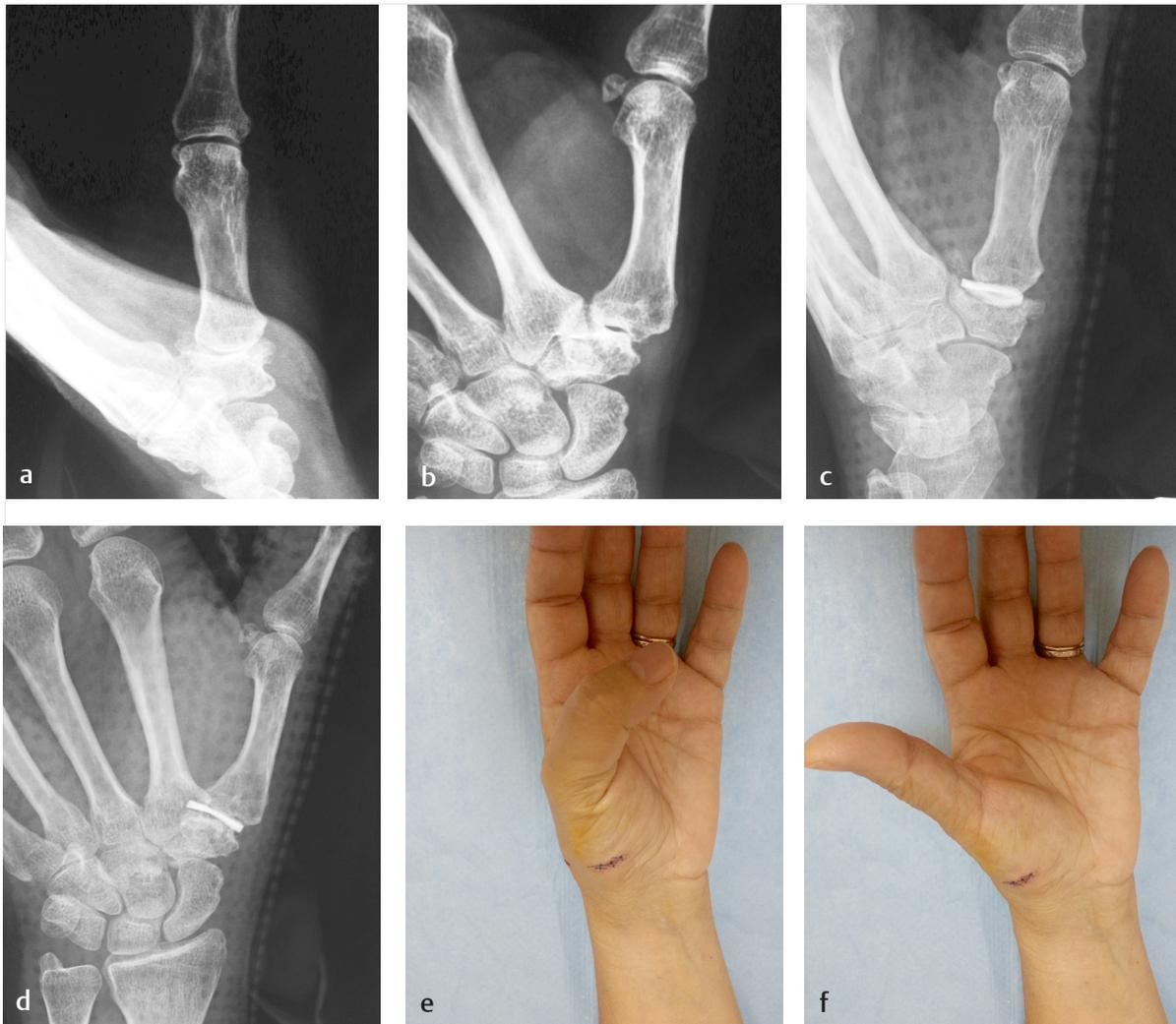


Fig. 24.10a–f Example of a clinical case. Anteroposterior (AP) (a) and lateral (b) X-rays of isolated osteoarthritis in the thumb carpo-metacarpal (CMC) joint with alignment maintained. AP (c) and lateral (d) X-rays after interposition of a pyrocarbon spacer. Photos of the thumb 7 days after surgery (e, f); the enlarged 1 palmar (1P) incision was closed with a few sutures.



Fig. 24.11a–c Drawing (a), intraoperative view (b), and arthroscopic view (c) of the third portal being made in the thenar eminence. This portal is located with a blunt trocar guide; the guide is inserted through the 1 dorsal (1D) portal and pushed until it reaches the volar side of the thenar eminence.



Fig. 24.12 Intraoperative view of the interposition implant held by forceps that cross the joint and emerge from the thenar eminence. The implant is pulled inside the joint.

Conclusion

As long as the indications are followed, interposition arthroplasty for thumb CMC arthritis is a straightforward technique for patients; it provides satisfactory results without burning any bridges in case another type of surgery is later needed.



Fig. 24.13a–d Example of a clinical case. Anteroposterior (AP) (a) and lateral (b) X-rays of isolated osteoarthritis in the thumb carpometacarpal joint with normal alignment. AP (c) and lateral (d) X-rays taken 2 years after interposition of a poly-lactide implant.

