MENTORS IN ORTHOPEDICS

UPDATE ON TREATMENT OPTIONS FOR THUMB ARTHRITIS

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AUTHOR

Philippe Pasquier - Polyclinique Montier La Celle, Saint-André-les-Vergers, France

SUMMARY

Background: Arthroplasty of the thumb requires the same level of clinical rigor as major joint replacement, necessitating precise case management and a documented decision-making process. Patients often present with failed conservative management using over-the-counter orthotics that do not address specific thumb column deformities or carpometacarpal (CMC) subluxation.

Objective: This article outlines a systematic approach to the clinical assessment and surgical management of basal thumb osteoarthritis, categorized by anatomical location and patient-specific functional requirements.

Key Points: Initial management should prioritize custom-made splints and occupational therapy. Surgical intervention is considered if pain persists after conservative trials, with the choice of procedure dictated by the specific site of degeneration: carpo-metacarpal (CMC), scapho-trapezio-trapezoidal (STT), or peri-trapezial (PT) arthritis. For STT arthritis, distal scaphoid resurfacing is presented as an alternative to arthrodesis. CMC arthritis is primarily managed with jointed prostheses, though dual-mobility and single-mobility designs show varying long-term survivorship. CMC arthrodesis remains a viable option for high-demand manual laborers. PT arthritis may be treated via trapeziectomy with ligamentoplasty or pyrocarbon interposition. Patient occupation and proximity to retirement are critical factors in determining the appropriateness of prosthetic versus palliative or arthrodesic procedures.

Conclusion: Successful outcomes in thumb surgery depend on a comprehensive preoperative assessment that aligns the surgical technique with the patient's age, occupational demands, and the specific radiographic grade of osteoarthritis. Accurate documentation of these clinical discussions is essential for informed consent and longitudinal care.

KEYWORDS

Osteoarthritis; Carpometacarpal Joints; Arthroplasty, Replacement; Trapezium; Orthopedic Procedures

Small implants are no small task, and the surgery should not just fill a gap in your schedule. The same level of care is needed for arthroplasty of the thumb as when performing an arthroplasty of the knee, hip or any other joint. This includes case management, especially in terms of keeping an accurate record of the decision-making process leading up to the surgery.

INITIAL CONSULTATION

It is very unusual for surgery to be offered during the initial consultation, because the patient is unlikely to have exhausted all different options for the functional relief of their symptoms.

Most of the time, the patient arrives wearing a shop-bought brace which, no matter how much or little it is worn, has not provided the hoped pain relief and functional improvement. Over-the-counter stabilising splints do not account for any thumb column deformity (especially carpometacarpal joint subluxation) and exert excessive pressure on certain areas, which can be painful. There is everything to gain by offering the patient a custom made splint, designed for their specific deformity. They will also need to be given instructions on how to wear it, whether at nights, during the day or at work.

Joint rehabilitation is of little benefit once the osteoarthritis has started. A few trial sessions could however be offered, focusing on pain management and a correct resting posture, for example. Occupational therapy may be useful if given early, in order to help protect the thumb via an assessment of the patient's workstation and an analysis of the thumb-finger pinch grip function.

Finally, the initial consultation should be used to find out more about the patient, their age, time to retirement, lifestyle (occupation, hobbies, sports, manual activities), expectations, reasons for wanting treatment (stiffness? pain? deformity?) and any possible impact that arthroplasty could have on their professional life.

It may be useful to ask the patient to return in a few weeks' time, to assess whether the suggested therapeutic steps are working. An assessment of patient compliance is essential before considering any more invasive procedures.

SECOND CONSULTATION

If the splint has been sufficient to stabilize the pain, it can be worn when required. Provided the patient has fully understood the purpose and is aware that if the situation worsens, one or more operations will certainly be needed in the mid-to-long term, an annual check-up should be sufficient.

If there has been no significant improvement in the pain, despite wearing the brace, surgery can be considered. The decision should be based on the patient's age and level of activity, and on the type and severity of the osteoarthritis. Imaging studies are essential. These should as a very minimum include bilateral x-rays (Kapandji views). The x-rays are used to determine the nature of the osteoarthritis and its severity (which is classified in various grades), bearing in mind that there is no strict correlation between radiographic severity and subjective pain.

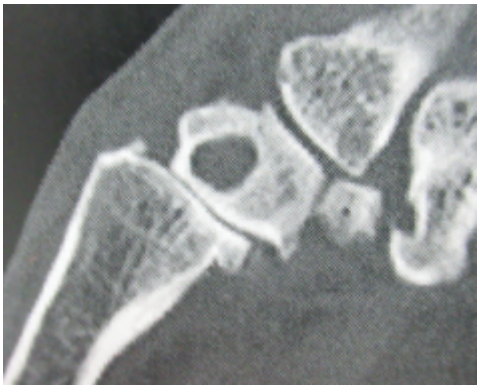

Figure 1

A CT scan may be requested if there is any uncertainty as to the quality of the bonestock, especially if there is any suspected osteolysis that could jeopardise the proposed surgery. Figure 1. There are three types of basal thumb osteoarthritis (Figures 2 to 4):

- CMC (carpo-meta-carpal)
- STT (scapho-trapezio-trapezoidal)
- PT (peri-trapezial)

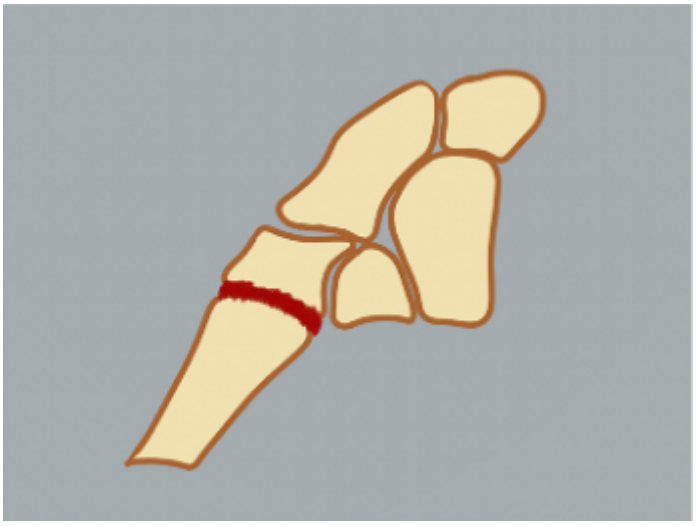

Figure 2

Figure 3

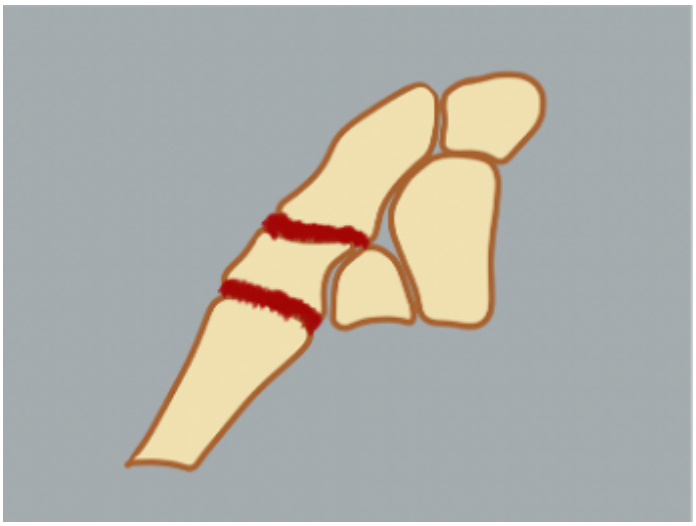

Figure 4

Each variant is typically linked to a specific surgical solution, although several alternatives are possible. These will be discussed later on. At this point in the management of the case, the indication for surgery should have been established and the type of arthritis identified. The next step is to determine how the surgery may affect the patient.

- If the patient is retired, there is usually no contraindication to surgery, whatever the procedure, but the limitations should always be clearly explained.

- The situation is more complex if the patient is still working. For sedentary jobs, osteoarthritis surgery usually has no major impact; however, other types of activity can be affected by surgery of the thumb column, especially those involving heavy labour (e.g. construction or industry). It is always wise to suggest the patient to contact their occupational physician to determine whether the surgery will prevent them from doing their job, and whether their duties will need to be adapted? Our colleagues in occupational medicine will usually do everything possible to allow the patient to stay at work, in which case there is no obstacle (in socio-professional terms) to the surgery.

Unfortunately, the patient's job may simply not be compatible with surgery (jobs involving a risk of injury/ working at height etc.) and in the worst-case scenario, the surgery could result in unemployment because the patient is no longer fit for the job. In this case, either the patient is reaching retirement in less than three

years and can register with the unemployment office for mandatory retirement or he will not be a candidate for surgery. It is important that the patient fully understands the situation and is aware of his rights. Whatever the situation, once all information has been provided, it is ultimately the patient who must make an informed decision about whether to go ahead with the surgery.

- If the patient is not due to retire, there is still the option of palliative surgery with denervation being the procedure of choice. Although I have never known any patients whose professional duties have been restricted by the occupational physician following joint denervation surgery, it is nevertheless important to take time to discuss the procedure, explain that it only targets the soft tissues, and is not a contraindication to continuing work.

Whatever the outcome, the patient's file must contain an accurate record of all discussions and decisions (and the patient must be sent a copy of all correspondence).

SURGICAL OPTIONS

Provided all obstacles have been removed, the next step in the treatment of unmanaged pain is surgery.

STT arthritis

The usual standard treatment is STT arthrodesis. This procedure has been widely tested and there are rarely any complications, and even non-union does not cause pain for a large majority of cases. Figure 5.

Figure 5

In fact, the patient is usually more bothered by the osteosynthesis material and can often ask for it to be removed. This is why my preferred technique is resurfacing the distal pole of scaphoid using an INCA™ prosthesis (Groupe Lepine). The procedure is quick and easy and can be performed through an anterior portal. The outcomes are good, with mild or zero pain and good finger opposition. Figure 6.

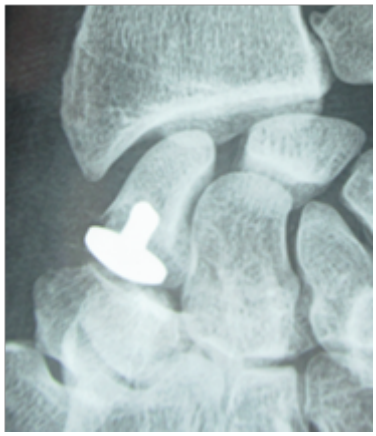

Figure 6

The other option is a distal scaphoid excision with tendon interposition (FRC strip), although I tend to use this as a revision solution following failure of a primary INCA arthroplasty. Figure 7.

Figure 7

CMC arthritis

This is the perfect indication for a joint prosthesis. All implants now work, so a good outcome will depend only on choosing the right technique for the right indication in the right patient. I have had great success with a constrained prosthesis (Maia) which I show to the patient before the surgery, letting them hear the “pop” as the neck locks securely into the cup. During the actual surgery, the patients are then reassured by this familiar sound which indicates the implant is in place and perfectly stable.

Preparations for the surgery can begin well in advance of the actual procedure. The portal is created in the patient’s hand, then the radiographs are analysed to determine the location of the arthritis and how the implant will work. Selection of the right size by using x-rays with the same scale than the x-ray templates. Assessing the positioning of a Maia implant, with the stem closely following the curve of the metacarpal, running along the lateral cortex is shown in figures 8 and 9. Centred on the trapezium, the x-ray confirms that the trapezium will allow for implantation of the cup.

Figure 8

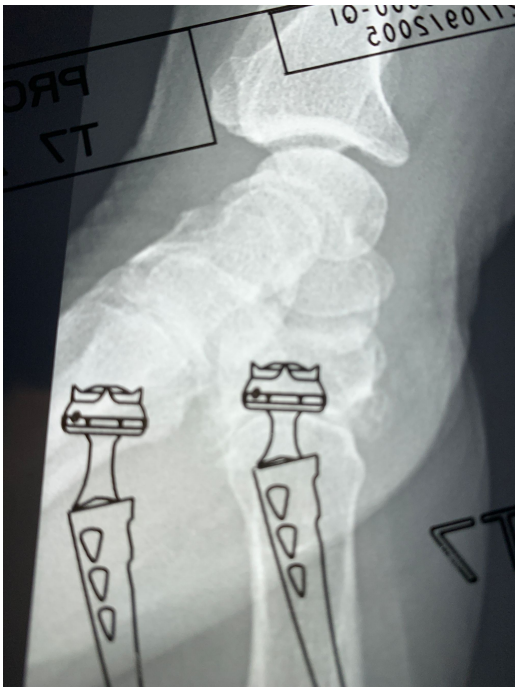

Figure 9

There are other types of implant, with single or dual mobility designs, usually designed for a cementless fit. It is hard to rank the different implants, and all series with 5 to 10 years FU report satisfactory outcomes for the designs currently on the market. Nevertheless, for dual mobility implants it is perhaps too early yet to determine their place. Supporters of dual mobility highlight the low rate of dislocation and lesser PE wear, whereas those who prefer single mobility designs argue with survivorship well beyond 10 years (17 years in one personal series using an ISIS™ implant).

Other authors defend the indication for a spacer. Modern spacers are usually made of pyrocarbon, with silicone being a historical solution not recommended anymore. Figure 10.

Figure 10

It is hard to consider spacers on a par with jointed implants for many reasons, above all stability. I see CMC arthritis as an indication for a jointed implant, except if there is a severe trapezium deformity [flattened trapezium] which is unsuitable for a prosthetic cup. I think that spacers come into play for cases of TM arthritis when there is a contraindication to a jointed implant. Figure 11.

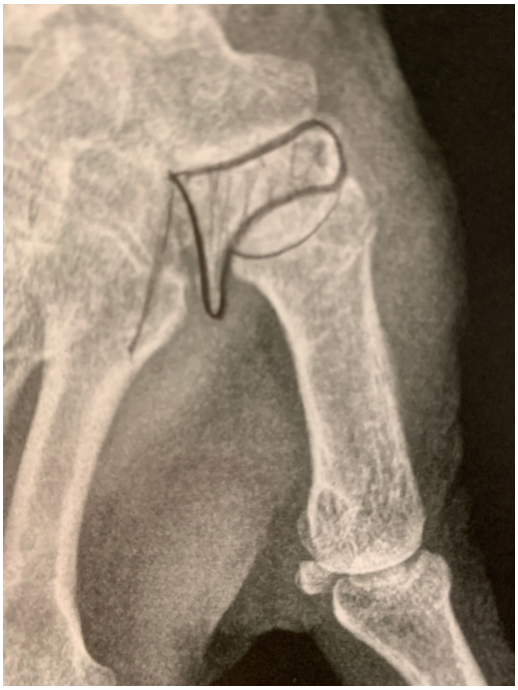

Figure 11

The final option is CMC joint arthrodesis. Most articles about this procedure date from the seventies and eighties, and it has now largely been replaced by arthroplasty. However, the technique should not be abanded, because it may be a viable alternative for young patients whose job involves heavy labour. The inability to bend the thumb is largely outweighed by significant gains in strength and little or no residual pain. Patients must be informed that, sooner or later, the STT arthritis will however get worse.

Figure 12 shows a patient aged about 60 who since 2008 has done a particularly manual job (construction industry) involving heavy loads, repetitive gestures, hammering etc. His doctor suggested CMC arthrodesis due to the mechanical restrictions which meant an implant was almost certainly infeasible. This was a wise decision, because the patient was able to continue working despite having limited movement in the thumb, with no significant pain.

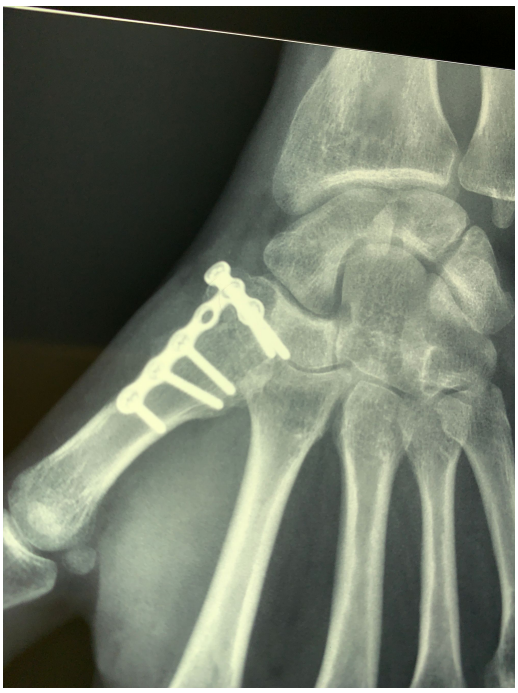

Figure 12

For the past few months, he has experienced progressive STT pain, which was worse when carrying loads and doing the thumb-finger pinch grip. The discussion with the patient soon turned to surgical options due to the lack of any clear improvement with orthotics. The solutions discussed were:

- Trapezium excision and interposition (requiring reversal of the CMC joint fusion)
- STT arthrodesis, quickly ruled out for functional reasons
- Distal scaphoid excision and tendon interposition
- Distal scaphoid resurfacing.

It did not take long to decide on resurfacing using the INCA implant (Figure 13), saving tendon imposition for the event of failure.

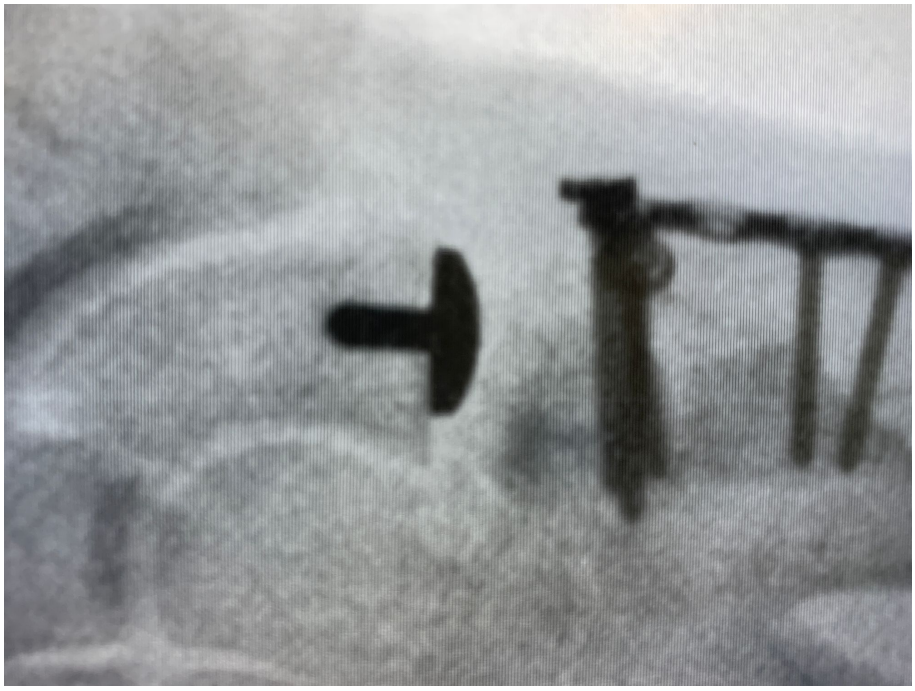

Figure 13

PT arthritis

This is the standard indication for a trapezium excision, which is hard to perform in isolation and interposition (implant or tendon) is also needed. Using ligamentoplasty to stabilize the joint, for which numerous techniques are available, represents an excellent indication for elderly patients.

I have had good results with the PyroDisk™ implant (Integra) (Figure 14) which, thanks to a wide choice of sizes (diameter and thickness) is great at filling the gap left by the trapezium excision. Ligament reconstruction is used to stabilize the implant and metacarpal, which holds the thumb column in place and prevents any implant instability (series currently under review). Figure 15.

Figure 14

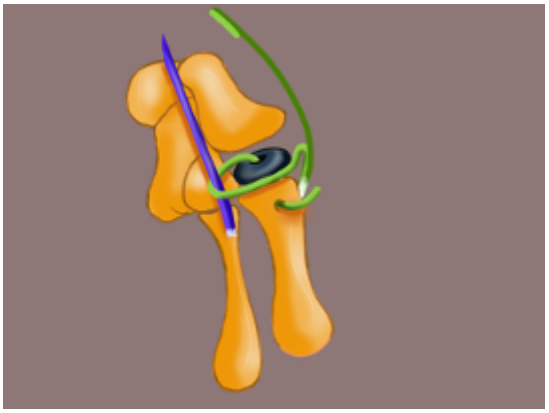

Figure 15

For young patients, after treating a certain number of cases with CMC implant and STT arthrodesis in a single procedure (a fairly complex operation) Figure 16, I now tend to use only a CMC implant but take care to avoid any soft tissue impingement, which leads to shortening of the thumb column (undersized implant). The risk of implant instability can be reduced by using a constrained cup design.

Figure 16

There are also implants that combine both STT arthrodesis and CMC arthroplasty. I have no experience with these devices. Figure 17. Finally, for this same indication of PT arthritis, some surgeons offer a double arthroplasty (STT and CMC) either using a CMC implant and STT spacer or a double spacer.

Figure 17

In conclusion, treating patients with thumb osteoarthritis requires a comprehensive assessment, which must be recorded in the file, taking account of the patient, their age, occupation and expectations, and the type and severity of the joint damage.

Regarding implant selection, due to the lack of any objective guidelines, the surgeon should perhaps choose the one with which he or she feels most comfortable.