

EXPERT OPINION ON PUBLISHED ARTICLES

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Treatment of osteochondral defects of the talus with a metal resurfacing inlay implant after failed previous surgery

CJA van Bergen, ICM van Ekeren, ML Reilingh, IN Sierevelt, CN van Dijk
Bone Joint J 2013;95-B:1650–55

This paper addresses a potential solution to a complex problem that sometimes occurs in a young active patient. Deep, large ($>150 \text{ mm}^2$) medial osteochondral lesions can be resistant to conventional arthroscopic treatment of marrow stimulation by microfracture, which then requires some form of revision procedure. Options include osteochondral allograft, osteochondral autograft transfer and autologous chondrocyte implantation. Each of these has its own limitations, expense, availability and donor site morbidity.

A metallic, modular implant has been developed (Hemi CAP; Arthrosurface Inc, Franklin Massachusetts) for the talus with 15 incremental offset sizes to resurface large defects and fill cystic lesions.

In this review, 20 patients underwent the procedure for medial talar osteochondral lesions (OCLs) following previous failed primary surgery. Four patients were not included because they had the procedure as their primary surgery, not revision.

All were symptomatic for at least a year. CT scans were obtained pre-operatively to size and grade the lesions according to the modified Berndt and Harty classification. The mean size of the lesion was 15 mm (11–20 mm) in the AP direction and 10 mm (8–14 mm) in the mediolateral direction.

Their technique required adequate exposure through a medial malleolar osteotomy. The lesion was debrided to a healthy cartilage rim and the implant placed after drilling with a guide pin perpendicular to the curvature of the talar dome. Trial implants allow precise positioning and seating depth of the implant on the screw to ensure counter sinking of 1–2 mm and a smooth interface with the shoulder and the dome. The malleolar osteotomy was fixed with two malleolar screws.

Outcome measures included the numeric rating scale (NRS) for pain at rest, walking, stair climbing and running, the AOFAS (American Orthopaedic Foot and Ankle hind foot score), SF36 and the Foot and Ankle Outcome score. Follow-up was for 2–5 years. There was no loss to follow-up. The patients were assessed and scored pre-operatively and then 3 months, 6 months, 1 year and 2 years, post-operatively.

The NRS scores improved significantly in all activities over the follow-up period and the AOFAS scores improved from a mean of 62 pre-op to 87 at final follow-up, which was significant. All patients who were working prior to the surgery returned to work and the majority were able to participate in some form of sport at final follow-up. One patient had a medialising calcaneal osteotomy for persistent ankle pain with varus hind foot mal-alignment, and in five

patients the medial malleolar screws were removed because of irritation. There were no other re-operations in the follow-up period. Radiologically there were no cases of loosening and the osteotomy healed in all cases. In one patient there was persistent subchondral sclerosis of the plafond and one had progressive subchondral cysts on the plafond, which were pain-free.

Although this is only level IV evidence with relatively short-term follow-up, it does open the door for further research into the use of implantable solutions for a complex problem. The authors stress that recessing the device 1–2 mm is essential and proved this in a biomechanical cadaver study.¹ The recessed implant becomes covered in fibrocartilage and thus acts as more of a biological surface in the long term with the ability to load share.

Pain in these larger lesions originates from the subchondral bone and the associated high hydrostatic pressure under load. This implant may reduce this by filling the cystic lesion and covering the open communication of the subchondral bone with the joint. Other biological solutions aim for the same thing: filling the cyst and covering the subchondral bone with either hyaline or fibrocartilage.

The NRS scores improved significantly in all activities over the follow-up period and the AOFAS scores also improved significantly

Some concerns do arise:

1. The difficulty in taking one of these out if one needed to. It would likely require another medial malleolar osteotomy through a scarred area and worsen the clinical result.
2. Erosion or wear of the corresponding tibial plafond. In this paper the authors identified changes in two patients at final follow-up. The clinical relevance is not clear, but is concerning. This may have a bearing on the longevity of the implant and the potential for OA.
3. The lack of long-term follow-up.

The authors stress that this implant is to be used in a salvage situation when other options include invasive, expensive restorative procedures. Further controlled prospective studies with longer follow-up are necessary to determine if this implant has a role in treating these lesions.

Reference

1. Van Bergen CJ, Zengerink M, Blanevoort L, et al. Novel metallic implantation technique for osteochondral defects of the medial talar dome: a cadaver study. *Acta Orthop* 2010;81:495–502.

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Corrective distal radius osteotomy following fracture malunion using a fixed-angle volar locking plate

S Opel, S Konan, E Sorene
J Hand Surg Eur. 2014;39(4):431-35

This article is a retrospective review of a single surgeon's corrective osteotomy technique for a malunited distal radius fracture. Twenty patients were included in the study, all of whom had a symptomatic malunion and complained of pain or limitation of function of the affected wrist. All patients complained of weakness or fatigue involving activities of pronation and supination. Limitation of these movements is generally more functionally debilitating for patients than restriction of flexion and extension.

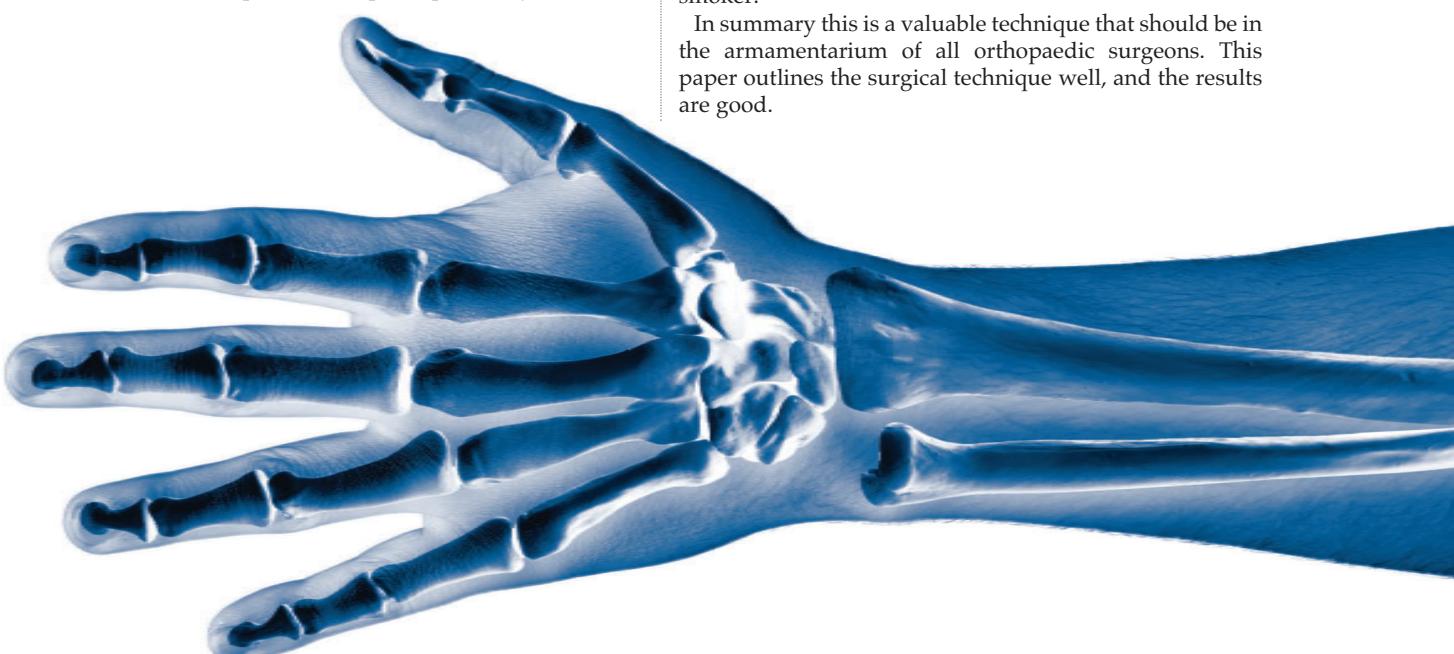
All patients underwent a volar corrective osteotomy using a fixed angle volar locking plate. This is the same technique that we use in our unit, and in the article the author outlines the surgical technique very nicely and highlights a few important steps. A volar extended approach is used. The radius is pronated to allow the dorsal periosteum to be elevated. The plate is first fixed distally using temporary K-wires. The plate is then removed and the osteotomy is made parallel to the joint using an osteotome. The plate is then fixed to the distal fragment and the reduction obtained using the plate to aid the reduction. The proximal screws are then inserted. No bone graft or substitute is used, and the patient is not immobilised in a splint or cast post-operatively.

The results were good. At an average follow-up of 14 months all patients had united (at an average of 12 weeks) and there were no complications reported. There was an improvement in function, ability to perform activities, and range of motion in all movements of the wrist. There was a good post-operative DASH score (average 13.48). Unfortunately no pre-operative DASH score was done to compare to.

This is an effective, safe technique that is relatively simple to perform. A few other important points to add are that the distal wires or screws should be inserted parallel to the joint under fluoroscopic guidance. Elevating the dorsal periosteum is an important step, because if not released it will act as a block to correction of the deformity after the osteotomy is performed. We prefer using an oscillating saw to perform the osteotomy to create a clean cut. An osteotome may fracture the dorsal cortex creating a spike of bone, which may then block reduction by impinging in the soft tissue, or may cause extensor tendon problems down the line. It is important though to keep the saw blade cool using saline to avoid thermal necrosis. The use of a laminar spreader in the osteotomy site helps to restore the radial length. The laminar spreader may also be inserted and opened in the space between the radius and ulna shaft, which may then further improve reduction by tensioning the interosseous membrane and the distal radio-ulnar ligaments, and corrects the common drift of the proximal radial shaft ulnarwards. This is also a useful technique to use when fixing an acute fracture.

Other benefits of this technique include not requiring bone graft and therefore limiting donor site morbidity and cost by not harvesting autograft or using allograft. The lack of dorsal hardware will reduce the chance of extensor tendon rupture. The approach is familiar to most orthopaedic surgeons. The stable fixation allows early range of motion. I would recommend caution though in performing any distal radius osteotomy in a heavy smoker.

In summary this is a valuable technique that should be in the armamentarium of all orthopaedic surgeons. This paper outlines the surgical technique well, and the results are good.



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Why do orthopaedic surgeons get sued after total hip replacements?

N Shah and J Hodgkinson
Bone&Joint 360, Vol 3, 1 Feb 2014, pp 42–45

This is a summary of a 'must read' article.

Consenting, documentation, communication

- You need full consent as well as accurate and detailed records.
- The surgeon should always see the patient before undertaking surgery.
- It is good practice to phone a relative or friend directly following surgery.

Nerve injuries

- This occurs in 1% of cases and does not necessarily indicate suboptimal care.
- Fifty per cent of sciatic nerve injuries occur without a known cause.
- If this should occur post-operatively, an exploration may be indicated but a clear record of the decision-making process should be documented.
- Documentation of protection of the nerve will help defence in these cases.

Leg length discrepancy (LLD)

- It is virtually impossible to guarantee equal leg lengths after THR.
- A third of the population has some asymmetry of leg lengths.
- Achieving a stable hip is a priority.
- Leg lengthening is a recognised non-negligent consequence of a hip replacement.
- Leg lengths are best assessed before surgery and brought to the patient's attention.
- Thorough documentation of leg lengths before and after trialling should be done as well as recording the difficulty in achieving equal leg lengths and stability with different neck and head options.
- A discrepancy of 1–1.5 cm would be reasonable in routine cases but lengthening of 3–4 cm would be difficult to support.

Component positioning

- Accurate component positioning, especially of the acetabular component, can be difficult and a tremendous variation has been identified even in the hands of experts.
- Less than optimal positioning is not always associated with failure or instability in the early post-operative stage, and good outcomes can be achieved even with less than optimal positioning.

Dislocation/instability

- Dislocation occurs in 1–3% of primary THR and 7–10% of revision THR, and is a recognised non-negligent complication after surgery.
- Dislocation remains a common reason for litigation.
- Patient education and preplanning is important.
- Documentation of anatomical or morphological variations, removal of osteophytes, component positioning, trial reduction, and assessment of intra-operative hip stability and leg length are also useful if it is alleged that dislocation has occurred because of negligence.

Persistent pain

- Pain after hip replacement is often a reason for litigation.
- Persistent pain does not always mean that the operation has failed.
- The cause of the pain should be vigorously investigated and there should be a low threshold for seeking a second opinion in some of these difficult cases.

Vascular injuries

- Vascular injuries after THR are extremely low.
- Pre-operative assessment should include clinical assessment of vascular status.
- Immediate vascular consultation is mandatory in major vascular injury.

Intra-operative periprosthetic fractures

- These fractures have become more common with the prevalence of revision THR as well as uncemented fixation and minimally invasive techniques.

Delayed diagnosis/treatment

- Common reasons for litigation include missed or delayed diagnoses with alleged prolonged pain suffering and loss of amenity.
- This may be the case with unexplained hip symptoms without obvious radiological cause. Extra special investigations need to be done depending on the symptoms to exclude reasons for the pain.
- Obtaining an early second opinion in difficult cases is very helpful.
- 'We also find joint operating in complex cases tremendously beneficial, as is the norm in many units doing spinal deformity surgery.'

Communication with the patient

- Inadequate consent prior to surgery is also a common allegation in negligent cases.
- It is important to counsel patients about risks and benefits with a frank and honest discussion. Some surgeons routinely copy their clinical notes to the patient detailing these discussions.
- Some units have patient education classes before surgery.
- 'In the event of a complication, honest channels of communication have to be maintained. Acknowledging and accepting that there may be a problem or suboptimal outcome, and genuinely trying to diagnose and treat it, goes a long way towards avoidance of complaints and litigation. Doctors owe a duty of candour to their patients. It is often helpful to ask for an experienced colleague to give an opinion. Maintaining good medical records is an essential principle of good medical practice'.

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Can tibial non-union be predicted at 3 months after intramedullary nailing?

JS Yang, J Otero, CM McAndrew, WM Ricci, MJ Gardner
J Orthop Trauma 2013 Nov;27(11):599–603

Purpose

The purpose of this study was to determine if surgeons could reliably predict if patients with tibia fractures treated with intramedullary nails will proceed to non-union based on their clinical scenario and radiographs at 3 months.

Methods

A blinded randomised questionnaire based on a retrospective cohort of 56 patients was given to three orthopaedic trauma surgeons. These 56 patients had intramedullary nails with incomplete healing at 3 months. All of these patients had gone on to develop non-union at 6 months but the reviewing surgeons were not aware of this.

Each case was developed into a vignette that included the 3-month radiographs and detailed clinical histories, and each surgeon was asked to predict if the fracture would go on to non-union.

Most institutions have a standard protocol of waiting for at least 6 months before acting on a non-union and this practice is supported by the SPRINT study

Results

The combined overall diagnostic accuracy of all three surgeons was 74%. Sensitivity and specificity was 62% and 77%, respectively. Radiographic features and injury mechanism were the most commonly cited clinical information used to predict fracture healing. The average positive predictive value was 73%. In nine patients with diabetes, the diagnostic accuracy was 88%.

Discussion

Up to 14% of tibia fractures treated with an intramedullary nail will develop a non-union. Most institutions have a standard protocol of waiting for at least 6 months before acting on a non-union and this practice is supported by the SPRINT study.¹ If experienced surgeons can reliably predict at 3 months which patients will go on to develop a non-union, then intervention in terms of reoperation can be offered and undertaken earlier. In this way patients will not be subjected to prolonged discomfort and disability.

Conclusion

The authors concluded that clinical judgment at 3 months allows for correct prediction of eventual non-union development in the majority of patients. They suggest that analysis of the entire clinical picture be used to predict fracture healing at 3 months.

When faced with clinical problems we all get a 'clinical hunch' based on experience that may not always go according to published literature or local protocols. This paper to some extent lends credibility to this intuition, which I think is a valuable part of clinical acumen. It may well have a subtitle that goes something like: 'The science of intuition'.

Reference

- SPRINT Investigators, Bhandari M, Guyatt G, et al. Randomized trial of reamed and unreamed intramedullary nailing of tibial shaft fractures. *J Bone Joint Surg Am.* 2008;90:2567–78.

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Treatment of thoracolumbar burst fractures: short-segment pedicle instrumentation versus kyphoplasty

Lei Zhang, Jun Zou, Minfeng Gan, et al.
Acta Orthop Bel. 2013;79:718–25

The objective of the study was to compare the clinical efficacy of percutaneous kyphoplasty versus short-segment pedicle instrumentation in the treatment of painful thoracolumbar burst fractures without neurological deficit.

This is an interesting study with the potential for clinical application.



Type of study

It is a retrospective study done over a one-year period. There were 48 patients who had type A3 thoracolumbar burst fractures. Twenty-three patients were treated with percutaneous kyphoplasty (PKP) and 25 underwent short-segment pedicle instrumentation (SSPI). The following parameters were used to compare the results: visual analogue scale, Oswestry Disability Index, kyphosis angle, vertebral body height (anteriorly and posteriorly), and spinal canal compromise.

Comments about the methodology

The effects of confounders may be significant in retrospective studies. There are six sub-groups of fractures classified as A3 (according to Magerl).¹ It is not clear from the study the specific type that was studied. Patient selection becomes difficult or impossible if a similar study is to be undertaken.

Patient selection is not stated, i.e. whether it was randomised or not. This is a key issue in the methodology. It becomes relatively easy for readers to check the element of bias if patient selection is clearly stated.

The authors do not mention the shortcomings of the study in detail to enable the reader to assess the quality of the study

Their results did not show any statistically significant differences in the parameters analysed. The follow-up period was two years. There is no indication about the power of the study. The authors do not mention the shortcomings of the study in detail to enable the reader to assess the quality of the study. There is no suggestion about what future studies should address.

The critical reader is not sure what the selected thoracolumbar fractures are in such a large group. The conclusion reached by the authors cannot be placed in a specific A3 group. In other words, to which A3 group do these results apply? It is not possible to answer this question based on the information in the article. The reader is not sure in which group(s) these techniques are contraindicated or if indeed there are contraindications.

The study probably has some clinical merit.

Reference

1. www.radiopaedia.org (last accessed 09/05/2014)

• SAOJ

PRODUCT NEWS



Fine Healthcare's Mignon Botes appointed CLIO Healthcare Awards juror

The Managing Director of Johannesburg-based strategic healthcare marketing and communications agency, Fine Healthcare, has been appointed a juror at this year's prestigious Clio Healthcare Awards in New York at the beginning of October. The Clio Awards, celebrating their 55th anniversary this year, are deemed to be the world's most recognised international awards competition for advertising, design and digital channels of communication.

Botes believes her experience of over 30 years places her in good stead to judge the quality of work in the discipline of healthcare, where regulatory restrictions are a consideration. 'I was very honoured to have judged the Cannes Lions awards some years ago and am equally thrilled to have been selected to serve on the executive jury of the Clio Healthcare awards,' she said.

The work submitted will be judged in a number of categories such as Print and Design, Direct, Digital and PR: 'I will be judging in the Film, Innovative Media, Integrated Campaign and Audio category. This is, to my mind, the most comprehensive and exciting category. Innovative Media and Integrated Campaigns, after all, will have elements of all the other categories embedded in the execution,' Botes added.

According to the descriptors on the website, Botes is the only judge from the African continent at the healthcare awards. The majority of the judges are from North America and other developed countries. 'In my experience, the sprinkling of representatives from developing nations bring very fresh and different thinking to the table,' she concluded.

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