

Journal Club: 21 January 2010
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Introduction

This journal club was used as an opportunity to review 6 recent papers applicable to orthopaedic practice at the North Hampshire Hospital. The meeting was attended by 7 consultants, 6 registrars and one FY2. All papers were read by all attending and each paper was presented in brief by one of the registrars. Their synopsis included a description of the aims, methods, results and conclusions of the paper. There then followed a general critique of the paper by all. To conclude the discussion of each paper, a decision was made regarding whether the paper had a valid message and whether that message was sufficiently strong to change practice at the North Hampshire Hospital.

Outcome after fixation of ankle fractures with an injury to the syndesmosis: the effect of the syndesmosis screw.

Hamid N, Loeffler BJ, Braddy W, Kellam JF, Cohen BE, Bosse MJ.
J Bone Joint Surg [Br] 2009;91-B:1069-73.

Review

Aims

The purpose of this study was to compare the clinical and radiological outcome of patients with intact, broken and removed syndesmosis screws after Weber B or C ankle fracture with an associated injury to the syndesmosis. The authors hypothesised that there would be no difference.

Methods

Following institutional review board approval, a retrospective review of all Weber B and C ankle fractures which were treated with syndesmosis screws were identified as the study population. Patients were then invited to be involved in the study for clinical and radiological follow up. AOFAS scoring and a visual analogue scale was used to assess the clinical results. AP/Lateral and mortise views were used to assess radiological outcome, measuring medial clear space and assessing radiolucency around the syndesmosis screws and whether or not the screw had broken.

Results

Of a possible 142 patients who fulfilled our inclusion criteria, 52 returned for clinical and radiological assessment at least one year after surgery. Of these, 27 had intact syndesmosis screws, ten had broken screws, and 15 had undergone elective removal of the screw. The mean American Orthopaedic Foot and Ankle Society

ankle/hindfoot score was 83.07 (sd 13.59) in the intact screw group, 92.40 (sd 12.69) in the broken screw group, and 85.80 (sd 11.33) in the removed screw group ($p = 0.0466$). There was no difference in clinical outcome of patients with intact or removed syndesmotom screws. Paradoxically, patients with a broken syndesmosis screw had the best clinical outcome.

Conclusion

The authors found the best functional results occurred in the group with broken screws and therefore concluded that their data did not support the removal of intact or broken syndesmosis screws, and they caution against attributing post-operative ankle pain to breakage of the syndesmosis screw.

Discussion

The study design was flawed as only 52 of 142 patients agreed to take part and be included in the analysis. Low numbers in the study. There was felt to be a lack of description in the methodology regarding original fracture pattern. The need for syndesmosis screw in all three cases with preoperative x-rays shown in the paper (all Weber B) was not clear. If all patients in this series had similar fracture patterns, many may not have required diastasis screw fixation. This will inevitably have affected results. A lower average age in the group with broken screws was noted which presumably reflects increased functional demand. Appropriate statistical analysis was performed. Follow up was as little as 12 months in some cases. This may not be long enough to recognise late failures. The discussion in the paper was felt to be appropriate but it was thought that the conclusions may not be valid given the inclusion criteria. It may have been more useful to analyse the results looking at Weber B and C fracture patterns separately.

The paper will not change practice at the North Hampshire hospital.

Ten-year results of a double-heat-treated metal-on-metal hip resurfacing.

Daniel J, Ziaee H, Kamali A, Pradhan C, Band T, McMinn DJ.

J Bone Joint Surg [Br] 2010;92-B:20-7.

Review

Background

Second-generation metal-on-metal bearings were introduced as a response to the considerable incidence of wear-induced failures associated with conventional replacements, especially in young patients. The authors present the results at ten years of a consecutive series of patients treated using a metal-on-metal hip resurfacing. A distinct feature of the bearings used in our series was that they had been subjected to double-heat treatments during the post-casting phase of their manufacture. In the past these bearings had not been subjected to thermal treatments, making this a unique metal-on-metal bearing which had not been used before in clinical practice.

Aims

To report the outcome of 184 consecutive hips (160 patients) treated using a hybrid-fixed metal-on-metal hip resurfacing during 1996.

Methods

Patients were invited for a clinical and radiological follow-up at a minimum of ten years. The Oxford hip score and anteroposterior and lateral radiographs were obtained.

Results

The mean age at operation was 54 years (21 to 75). A series of 107 consecutive hips (99 patients) who received the same prosthesis, but subjected to a single thermal treatment after being cast, between March 1994 and December 1995, were used as a control group for comparison. In the 1994 to 1995 group seven patients (seven hips) died from unrelated causes and there were four revisions (4%) for osteolysis and aseptic loosening. In the 1996 group nine patients died at a mean of 6.9 years after operation because of unrelated causes. There were 30 revisions (16%) at a mean of 7.3 years (1.2 to 10.9), one for infection at 1.2 years and 29 for osteolysis and aseptic loosening. Furthermore, in the latter group there were radiological signs of failure in 27 (24%) of the 111 surviving hips. The magnitude of the problem of osteolysis and aseptic loosening in the 1996 cohort did not become obvious until five years after the operation.

Conclusions

The authors results indicate that double-heat treatments of metal-on-metal bearings can lead to an increased incidence of wear-induced osteolysis.

Discussion

The paper was discussed and critiqued. The paper was a review of the clinicoradiologic results of hip resurfacing at 10 years in a cohort of patients who received an implant which had undergone a double heat treatment during the manufacturing process. The authorship was noted to include employees of a large implant manufacturing company now manufacturing a resurfacing implant with the senior author. The relevant manufacturing factors affecting an implants' tribological behaviour is reviewed in the article. The methodology was good. All patients are accounted for. The study was well designed and appropriate statistical methods were used. The failure rate was much higher in the double heat treated group. The authors attribute this to the double heat treatment and explain that the change in heat treatments during the manufacturing process was made without the clinical team being made aware. This illustrates the importance of communication between industry and clinical staff. It also illustrates the importance of appreciating that small changes in the manufacturing process of arthroplasty implants can lead to dramatic changes in performance, wear and clinical results.

Ischaemia and the pink, pulseless hand complicating supracondylar fractures of the humerus in childhood: long-term follow-up.

Blakey CM, Biant LC, Birch R.

J Bone Joint Surg [Br] 2009;91-B:1487-92.

Review

Aims

To review the longterm results of supracondylar fractures presenting with a pink but pulseless hand.

Methods

A retrospective review of case notes and x-rays for 26 children referred to a specialist unit with a 'pink pulseless hand' following a supracondylar fracture of the distal humerus after a mean period of three months (except for one referred after almost three years).

They were followed up prospectively for a mean of 15.5 years (4 to 26). The neurovascular injuries and resulting impairment in function and salvage procedures were recorded.

Results

The mean age at presentation was 8.6 years (2 to 12). There were eight girls and 18 boys. Only four of the 26 patients had undergone immediate surgical exploration before referral and three of these four had a satisfactory outcome. In one child the brachial artery had been explored unsuccessfully at 48 hours. As a result 23 of the 26 children presented with established ischaemic contracture of the forearm and hand. Two responded to conservative stretching. In the remaining 21 the antecubital fossa was explored. The aim of surgery was to try to improve the function of the hand and forearm, to assess nerve, vessel and muscle damage, to relieve entrapment and to minimise future disturbance of growth.

Conclusions

Based on their results, the authors recommend urgent exploration of the vessels and nerves in a child with a 'pink pulseless hand', not relieved by reduction of a supracondylar fracture of the distal humerus and presenting with persistent and increasing pain suggestive of a deepening nerve lesion and critical ischaemia.

Discussion

This paper was an interesting review of a small number of patients referred to a tertiary unit. The methodology was well described and the cases illustrated the message of the paper very well. It was noted that there were 53 nerve lesions (isolated and mixed) in these 26 patients. This paper is potentially therefore not applicable to patients with a supracondylar fracture and a pink but pulseless hand as the title suggests. It really applies to patients with a supracondylar fracture, a pink pulseless hand and a developing nerve lesion or critical ischaemia. It was not clear to our journal club whether some of the patients actually had developed a compartment syndrome and that this was the underlying pathology, rather than a true arterial injury at the fracture site. We

agreed that in patients with severe pain, developing signs of ischaemia or a progressive neurological deficit, surgical exploration should be considered. We do not believe that this paper has sufficient numbers of well defined patients to show that exploration of the fracture site is mandatory in the supracondylar with a pink, pulseless hand without other concerning features. We will continue to monitor these patients carefully as inpatients with a low threshold to explore the fracture if the patient develops the other signs referred to in this paper.

Cemented versus uncemented hemiarthroplasty for intracapsular hip fractures: A randomised controlled trial in 400 patients.

Parker MI, Pryor G, Gurusamy K.

J Bone Joint Surg [Br] 2010;92-B:116-22.

Review

Aims

To establish if whether there was any difference in outcome between treatment of displaced intracapsular fractures of the hip with a cemented Thompson hemiarthroplasty and an uncemented Austin-Moore prosthesis.

Methods

The authors undertook a prospective randomised controlled trial involving 400 patients with a displaced intracapsular fracture of the hip to determine whether there was any difference in outcome between treatment with a cemented Thompson hemiarthroplasty and an uncemented Austin-Moore prosthesis. The surviving patients were followed up for between two and five years by a nurse blinded to the type of prosthesis used.

Results

The mean age of the patients was 83 years (61 to 104) and 308 (77%) were women. The degree of residual pain was less in those treated with a cemented prosthesis ($p < 0.0001$) three months after surgery. Regaining mobility was better in those treated with a cemented implant ($p = 0.005$) at six months after operation. No statistically significant difference was found between the two groups with regard to mortality, implant-related complications, re-operations or post-operative medical complications.

Conclusions

The use of a cemented Thompson hemiarthroplasty resulted in less pain and less deterioration in mobility than an uncemented Austin-Moore prosthesis with no increase in complications.

Discussion

The paper had clear aims and well described methods. It addressed an important problem which is relevant to all surgeons with a trauma practice. The inclusion/exclusion criteria were well described and patient selection

justified. Good numbers enrolled in the trial. Thorough description of operative technique to ensure reliable comparison of the two treatment groups. The selection of two different implants was justified by common usage patterns. The authors were however comparing not only cemented versus uncemented implants, but also comparing two different implant designs. This means that any differences between the groups may be correct but may be incorrectly attributed to being cemented or uncemented. This is a potential source of type 3 error. The conclusions that a cemented Thompson hemiarthroplasty led to less pain, improved return of mobility and a reduced hospital when compared to an uncemented Austin-Moore prosthesis are valid. At the North Hampshire Hospital, routine practice is to cement a hemiarthroplasty implant but our journal club could not conclude from this paper that cemented hemiarthroplasty is better than uncemented.

Fixation stability of opening- versus closing-wedge high tibial osteotomy: a randomised clinical trial using radiostereometry.

Luites JW, Brinkman JM, Wymenga AB, Van Heerwaarden RJ.
J Bone Joint Surg [Br] 2009;91-B:1459-65.

Review

Aims

Valgus high tibial osteotomy for osteoarthritis of the medial compartment of the knee can be performed using medial opening- and lateral closing-wedge techniques. The latter have been thought to offer greater initial stability. This study aimed to test this theory.

Methods

The authors measured and compared the stability of opening- and closing-wedge osteotomies fixed by TomoFix plates using radiostereometry in a series of 42 patients in a prospective, randomised clinical trial.

Results

There were no differences between the opening- and closing-wedge groups in the time to regain knee function and full weight-bearing. Pain and knee function were significantly improved in both groups without any differences between them. All the osteotomies united within one year. Radiostereometry showed no clinically relevant movement of bone or differences between either group.

Conclusions

Medial opening-wedge high tibial osteotomy secured by a TomoFix plate offers equal stability to a lateral closing-wedge technique. Both give excellent initial stability and provide significantly improved knee function and reduction in pain, although the opening-wedge technique was more likely to produce the intended correction.

Discussion

This study was well designed and from authors with significant experience of osteotomy around the knee. The aims and methods were clearly described and the statistical methods described were appropriate to the study. The study failed to show that lateral closing wedge osteotomy has superior stability when using the fixed angle plates described. There was no difference between lateral closing and opening medial wedge osteotomy using Tomofix plates. There was no difference in clinical results in this study. We felt that the conclusions drawn were accurate. The paper does not show superiority of the medial opening wedge technique over lateral closing wedge osteotomy but the authors recommend that HTO be performed with a medial opening wedge technique. This reflects author opinion and previous experience. At the North Hampshire Hospital, senior surgical opinion also favours the medial opening wedge. The paper provides evidence of stability and supports the continuing use of medial opening tibial wedge osteotomy with fixed angle plates.

Measurement of joint effusion and haematoma formation by ultrasound in assessing the effectiveness of drains after total knee replacement: a prospective randomised study.

Omonbude D, El Masry MA, O'Connor PJ, Grainger AJ, Allgar VL, Calder SJ.

J Bone Joint Surg [Br] 2010;92-B:51-5.

Review

Aims

To assess whether the use of drains has an effect on the incidence of haematoma, effusion and postoperative haemoglobin levels.

Methods

The authors prospectively randomised 78 patients into two groups, 'drains' or 'no drains' to assess the effectiveness of suction drains in reducing haematoma and effusion in the joint and its effect on wound healing after total knee replacement. Ultrasound was used to measure the formation of haematoma and effusion on the fourth post-operative day. This was a semi-quantitative assessment of volume estimation.

Results

There was no difference in the mean effusion between the groups (5.91 mm in the drain group versus 6.08 mm in the no-drain, $p = 0.82$). The mean amount of haematoma in the no-drain group was greater (11.07 mm versus 8.41 mm, $p = 0.03$). However, this was not clinically significant judged by the lack of difference in the mean reduction in the post-operative haemoglobin between the groups (drain group 3.4 g/dl; no-drain group 3.0 g/dl, $p = 0.38$). There were no cases of wound infection or problems with wound healing at six weeks in any patient.

Conclusions

Our findings indicate that drains do not reduce joint effusion but do reduce haematoma formation. They have no effect on wound healing.

Discussion

This study was well designed and the paper contained good description of methods used. The sample size of 78 was sufficient for the statistical methods used. The authors did find a correlation between the use of suction drains and reducing haematoma formation. There was no difference in their described incidence in wound infection rates but the power of the study is unlikely to high enough to identify whether there is an association with the use of drains. The authors did not look at clinical results following the use of drains/no drains to see if there was any difference in rate of return of range of movement. We felt that this would have been a useful inclusion in the study.

This study is a useful adjunct to existing research but there remains great debate about the use of drains in total knee replacement.