



Original article

Trochanteric non-union in revision total hip arthroplasty: does it matter?

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The aims of this study were to assess whether trochanteric non-union is an important factor in revision total hip arthroplasty in terms of postoperative morbidity. We studied prospectively 97 consecutive patients undergoing revision total hip arthroplasty in the years 1992–1996. All operations were performed by one surgeon through a Charnley trans-trochanteric approach. The patients were followed-up over a period of 1–4 years and at 12 months postsurgery were assessed using a modified scoring system devised by D'Aubigne.¹ Anatomical union of the greater trochanter was assessed by an anterior-posterior pelvic radiograph at 12 months to decide if the greater trochanter was united in the correct anatomical position. The trochanteric non-union rate was 18.5% (18 out of 97 patients). There was no significant difference between the patients in terms of pain, function and satisfaction scores at one year between those with trochanteric union and those without. This study suggests that trochanteric non-union post revision total hip arthroplasty is not a cause of increased morbidity.

Key words: Trochanteric non-union – Revision total hip arthroplasty

Trochanteric osteotomy, as a surgical technique for gaining access to the hip joint during total hip arthroplasty, is controversial: on the one hand it provides excellent exposure of the acetabulum and facilitates correct alignment of the components, but it has been widely criticised for the additional problems associated with it. These include prolonged operating time and increased bleeding,² although some authors refute this.³ More notably, it has been blamed for increased postoperative morbidity due to three main factors: (i)

trochanteric bursitis (secondary to the wires); (ii) migration of the trochanter; and (iii) non-union of the trochanter. Because of these factors, many authors have advised against the use of trochanteric osteotomy except in such cases as revision, or in patients with distorted anatomy, where the better exposure afforded by the technique is necessary.

Many series have been published on the rates of non-union of the greater trochanter following trochanteric osteotomy, which vary between 1–29%.^{4–11} The authors

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Table 1 Pre-operative diagnosis

Revision (both components loose, aseptic)	38.1%
Revision (acetabular component loose, aseptic)	11.3%
Revision for infected prosthesis	11.3%
Revision for dislocated prosthesis	7.2%
Congenital dislocation of hip, subluxed	6.2%
Previous femoral shaft fracture	4.1%
Previous hip surgery, not total hip replacement	4.1%
Fractured Charnley stem	4.1%
Revision, aseptic loose stem	4.1%
Previous girdlestones	3.1%
Other primary, not Charnley	3.1%
Perthes	1%
Congenital dislocation of hip, dislocated	1%
Rheumatoid arthritis	1%

Table 2 Assessment of satisfaction, pain and function

	Union	Non union
Satisfaction		
1. Worse than before	1.3%	0%
2. Same as before surgery	1.3%	5.6%
3. Slight improvement	1.3%	5.6%
4. Operation worthwhile	21.5%	22.2%
5. Very good	74.7%	66.7%
Pain		
1. Severe and continuous	0%	0%
2. Prevents walking	0%	0%
3. Limited activity, rest/night pain	3.8%	5.6%
4. Pain after activity, but not rest	20.3%	27.8%
5. Pain on starting to walk, improves	12.7%	22.2%
6. No pain	63.3%	44.4%
Function		
1. Bedridden/few yards	3.8%	0%
2. Limited with/without support	15.2%	5.6%
3. Limited with one stick, < 1 h	17.7%	16.7%
4. Limited without stick	30.4%	33.3%
5. No stick, but limp	20.3%	22.2%
6. Very good	12.7%	22.2%

with the high rates of non-union^{7,9,10} argue against the use of the technique in uncomplicated total hip arthroplasty because of the likelihood of increased morbidity. This study was designed to assess the level of morbidity caused by trochanteric non-union in revision total hip arthroplasty.

Patients and Methods

A prospective study of 97 patients undergoing revision total hip arthroplasty was undertaken in our hospital over the period 1992–1996. The mean age of the patients was 65 years (range, 22–92 years). Pre-operative diagnoses are summarised in Table 1. All surgery was performed by the senior author.

All patients underwent a biplanar trochanteric osteotomy using a Gigli saw^{5,11} to gain access to the hip joint. Trochanters were subsequently re-attached using the standard double and single Charnley wires.¹²

Postoperatively, all patients had radiographs at day 1, and were mobilised on day 3, partially weight-bearing with crutches. Patients were reviewed in out-patients at 3 months initially and again at 1 year. At the 1 year clinic visit, their pain and function, using the method of the D'Aubigne and Postel, and satisfaction were assessed using a simple 5 question scoring system (Table 2).

Trochanteric union was assessed from a standard anterior-posterior radiograph at 12 months postsurgery. Non-union was defined as any visible separation of the trochanter or wire failure.

Results underwent statistical analysis using the chi-squared test with a 2 by 2 contingency table to assess whether there were any significant differences between the outcomes of patients with trochanteric union and those with non-union.

Results

No patients were lost to follow-up and there were no deaths or re-operations. The pain, function and satisfaction of the patients with trochanteric union were compared to those with non-union. These results are presented in Figures 1–3.

Pain scores were divided into 2 groups those with no pain in one and the rest in the other group. This generated a P value of $P>0.05$, i.e. no significant difference.

Function scores were divided into 2 groups, those who needed no stick to mobilise but had a limp or mobilised normally and those who did not achieve this. This generated a P value of $P>0.1$, i.e. no significant difference.

Satisfaction scores were divided into 2 groups: those scoring 'very good' and those who scored anything less. This generated a P value $P>0.1$, i.e. no significant difference.

Between the two groups there was no significant difference on each of the three parameters.

Discussion

The fact that no statistical difference could be found between the 2 groups of patients at 1 year for pain, function and satisfaction post trochanteric osteotomy is an important result, especially as non-union following osteotomy is a fairly frequent occurrence and is often cited as a reason to avoid the approach. The presumption that trochanteric non-union increases morbidity

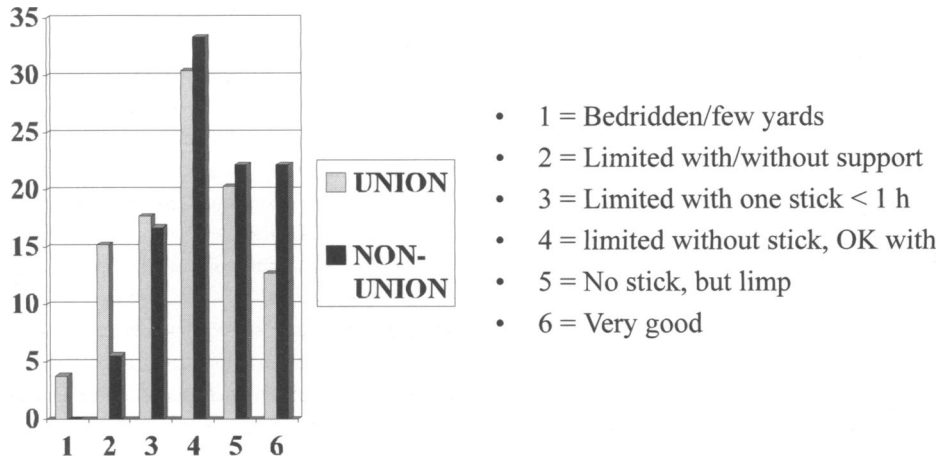


Figure 1 Function as reported by the patients with trochanteric union as compared to those with non-union

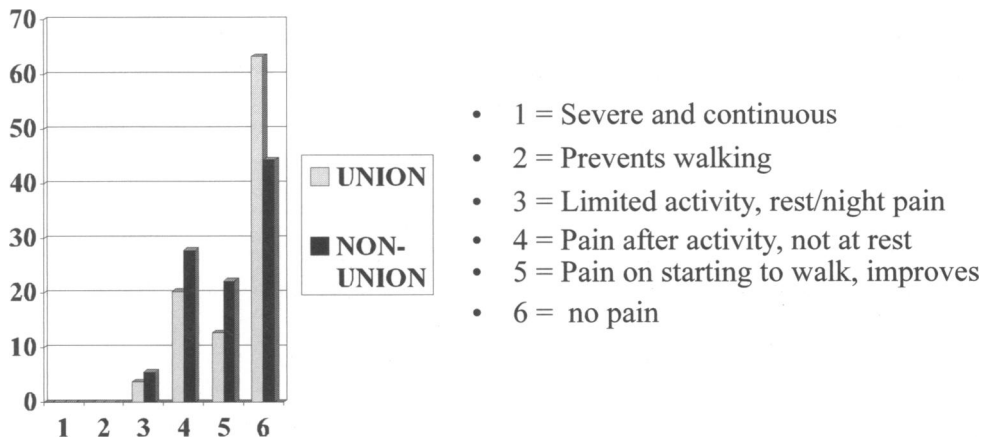


Figure 2 Pain as reported by the patients with trochanteric union as compared to those with non-union

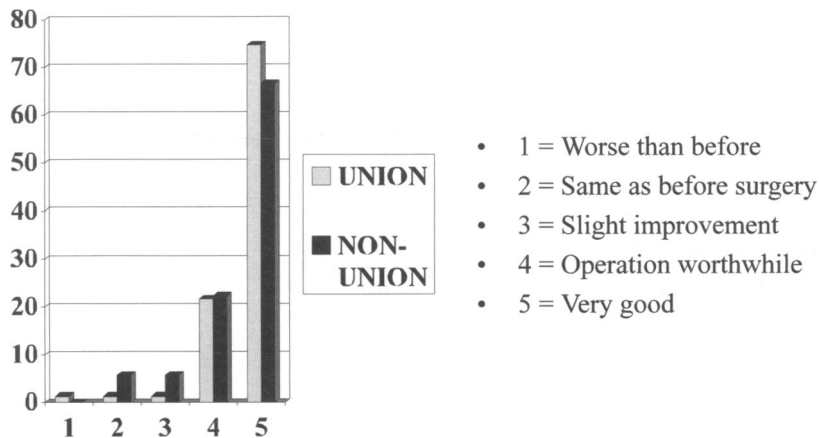


Figure 3 Satisfaction as reported by the patients with trochanteric union as compared to those with non-union

has not been found to be the case in this series of patients. From this study there appears to be no reason to abandon the trans trochanteric approach to the hip joint in revision surgery. The clinical success and lack of

further surgery,, even in the non-union group, should encourage others to adopt this approach in complex cases. Longer term follow-up is needed to evaluate further the functional significance of anatomical union.

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