

RESULTS OF EXCISION OF CALCANEAL PROMINENCE

A. BIYANI, D. A. JONES

Calcaneal prominence in 22 patients (37 heels) with moderate-to-severe symptoms was treated by excision after a minimum of 6 months of conservative treatment. There were 21 good, 12 fair and 4 poor results. Calcaneal exostectomy is a useful procedure in carefully selected patients.

Keywords : excision ; calcaneal prominence.

Mots-clés : résection ; exostose calcanéenne.

Prominence of the posterosuperior aspect of the calcaneus (variously known as Haglund disease, winter heel, bumpy heels, retrocalcaneal bursitis, calcaneal exostosis, pump bump and policeman's heel), is a common condition, especially in adolescent girls, as they start wearing high-heeled shoes or shoes with well-contoured heel counters. Most patients respond to conservative treatment, including advice on footwear, physiotherapeutic measures and, if necessary, short periods of immobilization in below-knee casts. However, some patients with a large posterior calcaneal protuberance fail to improve by nonoperative means and require surgical treatment in the form of either calcaneal osteotomy (3, 7, 8, 11) or excision of the prominence (5, 6, 9). Conflicting reports have been published in the literature regarding the usefulness of excision of the calcaneal prominence (5, 6, 9, 10). The present study evaluates our results of calcaneal exostectomy and emphasizes the need for meticulous surgical technique.

PATIENTS AND METHODS

Between 1984 and 1991, 37 heels in 22 patients (18 adolescent females, 3 adolescent males and 1 female aged 22 years) were treated surgically by excision of posterosuperior calcaneal prominence. All the patients had moderate-to-severe symptoms (table I) for 6 months

Table I. — Classification of calcaneal prominence

Mild :	Occasional pressure problems Does not require shoe alterations Can continue sports with minor discomfort
Moderate :	Frequent pain and pressure problems Sporting activity possible for short periods Can wear normal shoes without alteration
Severe :	Frequent/Constant pain Sporting activities markedly restricted Significant pressure problems with frequent blisters Can wear only trainers or shoes with soft/ padded heel counters

or more, including discomfort, limitation of activity and pressure problems with footwear. The prominence was either median or lateral on the posterosuperior corner of the calcaneus. Tenderness and inflammation over the prominence were present in all the cases. Weightbearing lateral radiographs of the calcaneus were taken, and the parallel pitch lines (4) and Fowler-Phillip angle (2) were measured. We also analyzed the Chauveaux-Liet angle (1), the angle of inclination and the total angle. The calcaneal apophysis had completely fused in all the cases.

OPERATIVE TECHNIQUE

Through a short, curved posterolateral incision, with the patient in the prone position, the posterosuperior aspect of the calcaneus was exposed. The inflamed bursa, if any, was excised and the periosteum over the calcaneus incised posterosuperiorly with minimum reflection. A wedge, the

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height of which was determined preoperatively by the parallel pitch lines allowing for 2-4 mm of overcorrection, was marked by an osteotome and cut by power saw, with care not to damage or lacerate the achilles tendon. Any sharp bony edges were smoothed, and the wound was thoroughly irrigated with saline to wash away the bony debris. The osteotomy surface of the calcaneus was covered with a thin layer of bone wax and the wound closed over a drain. Postoperatively, a nonweightbearing cast was applied, which was discarded at 2 weeks after suture removal. Progressive weightbearing was then commenced with a half-inch heel lift in the shoe for 3 to 4 weeks.

RESULTS

After a mean follow-up of 3 years (range 9 months to 7 years), 19 patients returned for a clinical review, and the remaining 3 patients (5 feet) who were unable to attend for a follow-up examination responded to a detailed telephone interview. The results were assessed according to a scoring system based on the clinical appearance of the heel, pressure problems, footwear, ability to return to active sports, patient satisfaction and presence or absence of any significant complications (table II). There were 21 good (fig. 1) and 12 fair results. Four feet in 3 patients with multiple residual problems were assigned a 'poor' score. Of the 15 feet with moderate preoperative symptoms,

Table II. Assessment criteria

		Scale of 0-10
A	<i>Patient Satisfaction</i>	
B	<i>Footwear</i>	
	Wears normal shoes and has no pressure problems	10
	Can wear normal shoes and has occasional pressure problems	7
	Can wear normal shoes for short periods and has frequent pressure problems, requiring padding of shoes	4
	Wears trainers only	2
	Footwear without heel counters	0
C	<i>Sports</i>	
	Active, unrestricted sports	10
	Active sports for short periods with some discomfort	5
	Cannot run/play active sports for any significant length of time	0
D	<i>Appearance</i>	
	As normal	5
	Improved	3
	No change/Worse	0
E	<i>Residual Prominence</i>	
	None	5
	Minor	3
	Significant	0
F	<i>Complications</i>	
	Sensory loss in sural nerve distribution	-3
	Hypertrophic tender scar	-5
	Achilles tendon weakness	-5
	<i>Results</i>	
	Good	31-40
	Fair	21-30
	Poor	< 20

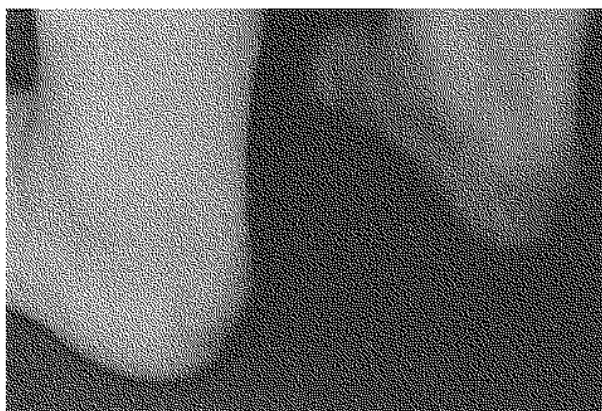


Fig. 1A



Fig. 1B

Fig. 1. - Marked bilateral calcaneal prominence with severe symptoms (A), with a good result (B) postoperatively.

10 had good and 5 fair results. There were 11 good, 7 fair and 4 poor results in 22 feet with severe initial symptoms (table III). Two patients (2 heels) gave a full score of 10 on the subjective scoring scale. Most patients with severe initial symptoms, with the exception of those with poor final results, noted equal or more subjective improvement on the scoring scale.

Table III. — Results

Severity of Original Symptoms	n	Final Outcome		
		Good	Fair	Poor
Moderate	15	10	5	0
Severe	22	11	7	4

Four patients returned to unrestricted sports activities and 15 were able to participate in all sports with some limitations. Three patients with 4 poor results were unable to play active sports for any significant length of time.

Postoperative wound-healing problems or achilles tendon weakness were not encountered in any of the cases. Complications included significant residual prominence (3 cases), persistent pressure problems (4 cases), hypertrophic, tender scar (3 cases), sensory dulling in the sural nerve distribution (transient 1, permanent 2) and significant heterotopic ossification (fig. 2) with reformation of

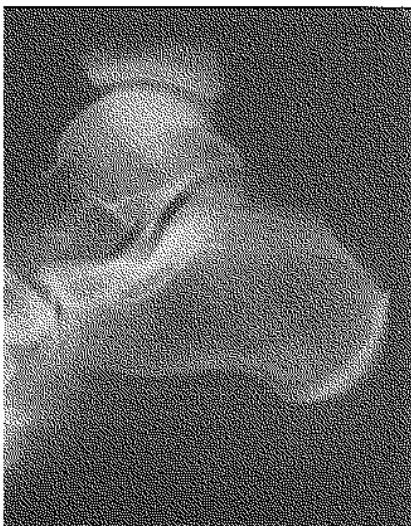


Fig. 2. — Callus formation 6 weeks after exostectomy in a patient with poor final results.

retrocalcaneal exostosis in one case. All but one of these complications were encountered in the feet with the poor results, the exception being a significant but asymptomatic calcaneal residual prominence in a patient with a fair result. All the poor results followed surgery for a severely symptomatic calcaneal prominence, and the only adult patient in the series also had a poor outcome.

DISCUSSION

Surgical treatment of a posterosuperior calcaneal prominence consists of either excision of the protuberance (5, 6, 9), or an osteotomy (3, 7, 8, 11), and there is no consensus regarding indications for the two operative procedures. Review of the literature does not reveal any studies comparing the results of calcaneal exostectomy and osteotomy. Moreover, there is lack of uniformity and reproducibility of assessment criteria, making it difficult to assess the relative efficacy of either procedure in any two series. Our assessment criteria have been designed to overcome these problems and are simple and accurate.

Of the two surgical problems, calcaneal osteotomy is more difficult to perform, requires more extensive dissection, and has higher chances of damage to the sural nerve. It also necessitates 6 to 8 weeks of plaster immobilization with or without internal fixation with either staples or cancellous screws. Problems with union of the osteotomy and staple or screw related complications should also be taken into consideration. Finally, a dorsally-based osteotomy may shorten the posterior lever arm of the Achilles tendon with resultant weakness. Therefore, we reserve dorsal calcaneal osteotomy for patients with calcaneal exostosis who have an associated cavus deformity or a relatively long calcaneus.

Excision of the calcaneal prominence, on the other hand, is relatively easy to perform and does not require long periods of plaster immobilization. Carefully performed calcaneal exostectomy is associated with relatively fewer complications. The most common cause of persistent symptoms is excision of an inadequate wedge of bone and

'trimming' (10) of the exostosis. The amount of bone to be excised can be determined preoperatively by parallel pitch lines, with a view to achieve a negative parallel pitch line of 2 to 4 mm. Any further overcorrection and damage to the achilles tendon should be avoided. Heterotopic ossification in the operative area is another common complication following exostectomy, and may lead to reformation of the retrocalcaneal prominence, as noted in one of our earlier cases. This complication can, however, be avoided by thorough lavage and use of bone wax; and we did not find it necessary to administer short-term indomethacin. Other minor complications include hypertrophic scar, residual scar tenderness, persistent pressure problems and injury to the sural nerve.

Most patients are symptomatically improved following calcaneal exostectomy, but continue to have minor residual symptoms. Return to competitive sports is usually not possible, but many are able to achieve a reasonable level of sporting activity without undue discomfort. Patients with severe initial symptoms tend to give equal or slightly higher subjective ratings at review, as compared to the patients with a lesser degree of initial symptoms. This, presumably, is because the patients in the latter group have higher expectations and hope to get back to normal, as compared to patients with severe symptoms, who are happy to get rid of pain and pressure symptoms.

We conclude that results of meticulously performed calcaneal exostectomy are satisfactory in carefully selected patients with radiographically large exostoses and significant symptoms after an adequate period of conservative treatment. Clinical severity and intractability of symptoms are more pertinent than radiographic size of the prominence in deciding on a surgical treatment. Patients with a minor radiographic prominence with overlying bursal inflammation may have significant symptoms transiently, but are likely to respond to conservative treatment. Surgery should not be offered for cosmetic reasons to patients with minor symptoms in the presence of large exostoses, as they are likely to continue to experience some residual symptoms postoperatively.

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SAMENVATTING

A. BIYANI en D. A. JONES. Resultaten van de excisie van de posteriore calcaneale rand.

Bij 22 patiënten (37 hielen) met matige tot ernstige klinische tekenen werd de postero-superiore calcaneale rand wigvormig gerecesseerd, na minstens 6 maanden conservatieve proefbehandeling. Er waren 21 goede, 12 matige en 4 onbevredigende resultaten. Deze exostosectomie geeft bemoedigende resultaten wanneer de indicatie zeer zorgvuldig gesteld wordt.

RÉSUMÉ

A. BIYANI et D. A. JONES. Résultats de la résection d'exostoses calcanéennes postéro-supérieures.

La saillie postéro-supérieure du calcanéum fut traitée par résection chez 22 malades (37 talons), qui présen-

taient des symptômes modérés à graves après un traitement conservateur d'essai d'au moins 6 mois. On note 21 bons résultats, 12 moyens et 4 médiocres. L'exostosectomie calcanéenne postérieure donne de bons résultats si l'indication est soigneusement posée.