



# Utilitarian Results of Ultrasound Guided Steroid Injection for Retrocalcaneal Bursae

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## ABSTRACT

**Introduction:** Retrocalcaneal bursitis is an annoying and testing clinical issue that is portrayed by pain anterior to the tendon just superior to its insertion in the os calcis. The treatment for retrocalcaneal bursa has been varied and inconsistent starting from analgesia, modified shoe wear, injection, calcaneal osteotomy, Achilles tendon debridement, excision of the retrocalcaneal bursa and nobody knows what procedures result in optimal clinical outcomes. The aim to assess the functional outcomes of patients with retrocalcaneal bursitis treated with ultrasound-guided methylprednisolone injection. **Materials and Method:** This is the prospective study done in Sri Ramachandra medical college during the period April 2018 to August 2019. We had twenty-five patients in study six of them were male and nineteen were female. The diagnosis of retrocalcaneal bursitis was made based on clinical examination and radiological findings. Steroid injection was administered under ultrasound guidance and findings were noted at regular follow up. American orthopaedic foot and ankle score (AOFAS) was obtained from the patient before the procedure and the score was recorded in the patient's medical record. **Results:** Mean pre-op AOFAS score was 50.4 whereas the mean post-op score was 69.4 at 4 weeks 76.4 at 3 months and 80.3 at the end of 6 months. **Conclusion:** The functional outcome of patients with retrocalcaneal bursitis treated with ultrasound-guided methylprednisolone injection was shown to have good results in all patients with no complications.

**Key Words:** Retrocalcaneal bursitis, Steroid injection, AOFAS score, Achilles tendon, Ultrasound.

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## INTRODUCTION

Retrocalcaneal bursitis is an annoying and testing clinical issue that is portrayed by pain anterior to the tendon just superior to its insertion in the os calcis. [1] Symptomatic aggravation of the retrocalcaneal bursa is brought about by redundant impingement of the bursa between the front part of the Achilles tendon and the hardback unrivalled calcaneal prominence. [2] The treatment for retrocalcaneal bursa has been varied and inconsistent starting from analgesia, modified shoe wear, injection, calcaneal osteotomy, Achilles tendon debridement, excision of the retrocalcaneal bursa and nobody knows what procedures result in optimal clinical outcomes. [3-6] Injection plays an important role in the treatment of diseases, one of the most common nursing procedures and an integral part of the clinical role of nurses which must be performed safely. [7,

8] Intratendinous or peritendinous corticosteroid injection may bring about Achilles tendon rupture and in animal studies demonstrated activating of biochemical and mechanical changes of ligaments. Although the Achilles tendon is the strongest ligament of the human body, the rupture was common in sprinters and jumpers, so blind administration of corticosteroid injection around heel will cause rupture of Achilles ligament, however, the reasons of this is misty. Hence in this study, we aim to assess the functional outcomes of patients with retrocalcaneal bursitis treated with ultrasound-guided methylprednisolone injection.

## MATERIALS AND METHOD:

This is the prospective study done in Sri Ramachandra medical college during the time April 2018 to August

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2019. We had twenty-five patients in study six of them were male and nineteen were female. Out of the 25 patients, five of them had bilateral involvement and 20 of them had unilateral involvement. We had two male and three female having bilateral foot involvement. Out of the 30 feet that were studied, 18 were right and the remaining 12 were left. The entire study patients were having symptoms at least for one year with failed conservative management and were advised to undergo surgical intervention by their previous consultants. Institutional ethics committee clearance was obtained. Proforma for this study and consent for the procedure was obtained. History regarding symptoms, trauma, drug usage, and treatment history was obtained. Pre-injection workup by clinical examination was done to rule out other probable causes of posterior heel pain such as recent trauma, plantar fasciitis and congenital disorders. The diagnosis of retrocalcaneal bursitis with or without associated Haglund's deformity was made clinically supported by x rays. American orthopaedic foot and ankle score (AOFAS) was obtained from the patient before the procedure and the score was recorded in the patient's medical record. [9] The balance of physical, emotional, social, spiritual, and intellectual health is defined as optimal health, enhance awareness, change behavior and create environments that support good health practices used to facilitate life style changes. [10]

All patients underwent a diagnostic heel ultrasound examination immediately before the ultrasound-guided Retrocalcaneal bursa injection. The same musculoskeletal radiologist performed all pre-injection diagnostic heel ultrasound examinations. Colour Doppler images were obtained using an ACUSON Sequoia 512 US machine and a (7-12 MHz) linear probe to assess the presence of retrocalcaneal bursitis. A dynamic sonographic evaluation was performed to evaluate for Achilles tendon tear with passive movement of the foot. When examining the retrocalcaneal bursa using ultrasound, the patient assumes the prone position with the ankle and foot joint hanging loose from the edge of the bed. A linear high frequency (7–12 MHz) ultrasound probe was used. The probe was held on the dorsal aspect of the Achilles tendon, parallel to the fibres under longitudinal sonographic view, the retrocalcaneal bursa appears as a triangular hypoechoic lesion situated between the Achilles tendon and the calcaneus. Patients were categorized as having sonographic retrocalcaneal bursitis if there was bursal distension >3 mm. [11] The ultrasound-guided injection treatment of retrocalcaneal bursitis was performed under the transverse sonographic view. The 21gauge needle was used for the injection purpose. Under the transverse view, sonographic-assisted injection of methylprednisolone 2 mL was performed into the retrocalcaneal bursa using a lateral approach. An additional sonographic image is

obtained. This final image further confirms that the steroid injection was within the retrocalcaneal bursa. Postoperatively, the patient was given on oral analgesics for 7 days and a half-inch heel rise. The patient was reviewed at 4 weeks, 3 months and 6 months postoperatively. AOFAS scoring was done at every review. In the case of patients who had bilateral foot involvement, they were given injection simultaneously on the same day.

## RESULTS:

Out of the 25 patients involved in the study, 19(76%) of them were female showing female preponderance. 5(20%) patients involved had bilateral complaints with three of them being female. Two (33.33%) out of six male patients involved in the study had a bilateral foot problem and three (15.7%) out of 19 of females involved in the study had bilateral complaints. Of the 30 feet under survey 18(60%) of them were right and the remaining 12(40%) of them left. 12(48%) of patients belong to the age group of 41-50 years. Mean age being 51 years. Mean age of men being 53 years and mean age of women being 50 years. Most of the patients (72%) involved in the study had no co-morbid. The mean AOFAS score was tabulated in table 1.

## DISCUSSION:

The treatment of Retrocalcaneal bursae remains a significant orthopaedic challenge. The various surgical methods described to treat this problem have produced mixed results, making it difficult for physician and patient alike to decide under what circumstances to intervene surgically. [12, 13] Corticosteroids have been used to treat and was administered blindly. Some clinicians advise against blind injection near the Achilles tendon because of the possibility of inadvertent intra-tendinous injection and fear of subsequent Achilles tendon rupture. [14, 15] Ultrasound-guided injections into the retrocalcaneal bursa is easily performed. At our institution, image-guided retrocalcaneal bursal injections were routinely performed under sonographic guidance.

Mean pre-op AOFAS score was 50.4 whereas the mean post-op score was 69.4 at 4 weeks 76.4 at 3 months and 80.3 at the end of 6 months. On statistical analysis from table 2, it has been found that the increase in AOFAS scores pre-operatively and post-operatively to be significant thereby indicating a functional improvement among patients. Mean increase in AOFAS score at the end of 6 months was 29.9. It was observed that patients who had symptoms for a longer duration (6 months or more) had poorer functional outcome (AOFAS-78.9) when compared to patients with duration of symptoms less than 6 months (AOFAS-82.6), These scores were compared 6 months following injections. Functional outcome of

patients was not altered by the presence of symptoms either being unilateral (80.2) or bilateral (80.6). Sex of the individual alter the outcome following injections as the scores at the end of 6 months were 83.2 in males and 79.3 in females respectively. Though there was a significant difference in functional outcome between male and female, this could be attributed to the disparity in the number of male patients compared to that of female patients. The laterality of symptoms had little to do with the outcome with the right foot having a score of 79.2 and left foot a score of 82.08 at the end of six months post injections. Analysing the outcome at the end of 6 months in patients with and without co-morbidity showed no difference in outcomes. 15 out of 30 feet had good AOFAS score (80-90) at the end of 6 months post injections. None of the patients develops any complications about the procedure. In our study, we observe that the patients undergoing injections for retrocalcaneal bursitis have shown fair to good results at the end of 6 months following ultrasound-guided Depo-Medrol injection for whom conservative management has failed and significant short-term pain reduction was achieved with our technique, with a mean AOFAS score at the end of 6 months was found to be 80.3 showing a mean improvement of 29.9. These results are comparable to other similar studies carried out by Shlomit Goldberg-stein et al. [15] Retrocalcaneal bursitis often

clinically present similarly to those with insertional Achilles tendinopathy. [16, 17] We analyzed the sonographic presence or absence of insertional Achilles pathology and Retrocalcaneal bursitis in patients with posterior heel pain referred for retrocalcaneal bursa injection. We patients with Achilles tendon pathology and without sonographic retrocalcaneal bursitis can nevertheless benefit from the bursal injection, as they did in our study.

## CONCLUSION:

The functional outcome of patients with retrocalcaneal bursitis treated with ultrasound-guided methylprednisolone injection was shown to have good results in all patients with no complications. We conclude that with ultrasound, the Achilles tendon and the retrocalcaneal bursa are easily distinguished, and the injection needle can be accurately guided into the retrocalcaneal bursa under direct real-time visualization without traumatizing the tendon and other nearby soft tissue structures.

The limitations of the study were short follow up, only one scoring system to quantify the results and further research is required to determine the longer-term risks and benefits of this procedure.

**Table 1-** Mean AOFAS Score

Gender		N	Mean	Std. Deviation	Std. Error Mean
AOFAS SCORE PREOP	Male	6	52.67	9.201	3.756
	Female	24	49.79	8.552	1.746
AOFAS SCORE (4weeks)	Male	6	73.33	9.501	3.879
	Female	24	68.46	6.909	1.410
AOFAS SCORE (3months)	Male	6	81.50	6.025	2.460
	Female	24	75.08	7.174	1.464
AOFAS SCORE (6months)	Male	6	84.83	4.535	1.851
	Female	24	79.21	3.934	.803

**Table 2-** Independent sample test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
AOFAS SCORE PREOP	Equal variances assumed	.128	.724	.726	28	.474	2.875	3.958
	Equal variances not assumed			.694	7.318	.509	2.875	4.142
AOFAS SCORE (4weeks)	Equal variances assumed	.109	.744	1.436	28	.162	4.875	3.395

	Equal variances not assumed			1.181	6.385	.280	4.875	4.127
AOFAS SCORE (3months)	Equal variances assumed	.948	.339	2.013	28	.054	6.417	3.187
	Equal variances not assumed			2.242	8.929	.052	6.417	2.863
AOFAS SCORE (6months)	Equal variances assumed	.465	.501	3.044	28	.005	5.625	1.848
	Equal variances not assumed			2.787	7.004	.027	5.625	2.018

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