



Retrospective study of the incidence of plantar fascial rupture following cortisone injection

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The Foot and Ankle Online Journal 9 (1): 9

The incidence of plantar fascial rupture or tear was not found in this study of 192 patients with a diagnosis of plantar fasciitis and who received cortisone injections for treatment. Of the 192 patients 38 patients had up to 6-12 injections given over period of months to years without any incidence of fascial rupture or tear. The thickness of the plantar fascia was recorded in some of the patients. There appears to be a high correlation between unsuccessful treatment and the thickness of the fascia. Why and how this occurs needs to be further investigated. Cortisone injections are safe and often effective treatment for plantar fasciitis either as a primary or secondary treatment.

Key words: Plantar fascia rupture, tear, cortisone injection, fascial thickness, safety issues regarding cortisone injection, other factors contributing to plantar fascial rupture or tear.

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Cortisone injections have been used for many years as one of the main treatments for plantar fasciitis as well as other joints and tendons [1-4]. There are cases reported in the literature of rupture or tear of the plantar fascia after cortisone injection [5]. Rupture of the plantar fascia is rare yet it has been linked causally to cortisone injections [6,7]. Recently reviewing the medical literature there were several articles by authors espousing cortisone injections rupture the plantar fascia and therefore, should be avoided especially in runners or athletes [7]. There may be several causes of the fascial tear or rupture other than cortisone injection. There are acute injuries of the plantar fascia occurring to professional athletes like NFL and NBA players; chronic plantar fasciitis may gradually weaken the fascia making it more susceptible to tear or rupture; chronic enthesopathy may also weaken the fascia increasing the susceptibility to tear or rupture; oral steroid usage and fluoroquinolone antibiotics have been associated with tear or rupture of the plantar fascia [5-10].

Over the past 20 years the adult population of US citizens weight has increased significantly contributing to chronic plantar fasciitis [3,11]. In order to determine the incidence of plantar fascial rupture after cortisone injection, a retrospective study was done in a clinic that had 8 podiatric physicians and surgeons treating patients with plantar fasciitis. The study intends to elucidate the safety of cortisone injections for the treatment of plantar fasciitis as well as determine the incidence of plantar fascial tear or ruptures after cortisone injections. Furthermore, the question arises why 3 cortisone injections are the absolute limit for the treatment of plantar fasciitis.

Method

There were 269 randomly selected patient charts reviewed with the diagnosis of plantar fasciitis. Of these charts 192 were accepted for the study. Patients who did not receive a cortisone injection for treatment of their plantar fasciitis, were excluded from the study. The patient charts that were accepted data was collected in the form of the number of injections each patient received and there follow-up time. All 8 of the podiatric physicians used the same injection medications. The thickness of the plantar

fascia was measured and documented if available. Not all the doctors measured the thickness of the plantar fascia when using the diagnostic ultrasound. The charts were reviewed to determine if any patients experienced a rupture of the plantar fascia after cortisone injection. This was recorded.

Results

There were no plantar fascial ruptures after cortisone injection. All the patients had been injected using 1cc of Celestone Soluspan mixed with 2ccs of .5% plain Marcaine plus 1cc of B12. There were a total of 618 injections using the above injectable given to the 192 patients. This was an average of 3.21 injections per patients. There were 30 patients who received 6 injections each during their treatment course. There were 3 patients who received 8 injections over a 2-3 month time period. There was one patient who received 9 injections over a 2 year period for bilateral plantar fasciitis. There were 2 patients who received 10 injections bilaterally over a 2 years 11 month period. There were 2 patients who had received up to 12 injections over a 5-7 month period. These patients had no rupture of their plantar fascia. 15 out of the 192 patients had EPFs (endoscopic plantar fascial release) performed. This was 7% of the patient population studied. The average plantar fascia thickness for the right foot was 6.0mm. The average plantar fascia thickness for the left foot was 5.9mm. The range for the right foot was 3.9mm to 9.7mm whereas for the left foot was 3.7mm to 10.1mm. There were 47 of 192 patients who had their right plantar fascia thickness measured. For the left plantar fascia, there were 53 of 192 patients measured.

Discussion

The incidence of plantar fascia rupture after cortisone injection is a rare occurrence. In this study of 192 patients, there were no incidences of plantar fascia rupture after cortisone injections. The average number of cortisone injections was 3.21 per patient with plantar fasciitis. Yet, there were a total of 8 patients who had more than 8-12 injections without an incidence of plantar fascia rupture or tear. Furthermore, there were 30 patients who had 6 injections to their heels for plantar fasciitis or 15%. Again, there was no incidence of plantar fascia rupture or tear after multiple injections given over

months to years. There have been studies that reported the thickness of the plantar fascia may indicate that conservative treatment will most likely not succeed. How the plantar fascia thickness affects conservative treatment is yet unknown. But these studies suggest there is a high correlation. Patients whose plantar fascia was measured using diagnostic ultrasound for the right foot the average thickness was 6 mm. The left foot the average thickness was 5.9mm. This is similar to the findings of other studies [8-10]. Seven percent of the patients reviewed in this study had EPFs performed as a result of failure of conservative treatment to resolve their plantar fasciitis. This might suggest that 93% of the patients had some degree of success with conservative treatment.

Conclusion

This study supports the continued use of cortisone injections for patients suffering from plantar fasciitis. There were no incidences of plantar fascia rupture or tear after cortisone injection. Thirty eight patients in this study had more than 6-12 injections over period of months to years. This appears to dispel the myth that 3 cortisone injections per patient is the absolute limit for the treatment of plantar fasciitis. The author recommends if deciding to exceed the 3 injection limit, the injections are given over a period of several weeks to months in between just to be cautious and allow the body to absorb the medication in a timely manner in case other cortisone injections are to be considered or given. The cortisone injections used in this study proved to be reliable, safe and in most cases relieved heel pain. Patients receiving multiple injections exceeding 3-12 had no incidence of plantar fascia tear or rupture. The study supports that the thickness of the plantar fascia seems to affect the outcome of conservative treatment. How the thicker fascia is least affected by conservative treatment is not known at this time. This study did not determine at what thickness the plantar fascia would be resistant to conservative care. It is possible that the thicker the fascia the more resistant to tear or rupture after multiple cortisone injections. This is a possible future study.

References

1. Ingle, DJ (October 1950). "The biologic properties of cortisone: a review". *J. Clin. Endocrinol. Metab.* 10 (10): 1312-1354/ doi: 10/1210/jcem-10-10-1312. PMID 14794756.
2. Woodward, RB, Sondheimer, F., Taub, D. (1951). "The Total Synthesis of Cortisone." *Journal of the American Chemical Society* 73 (8): 4057-4057. Doi: 10.1021/ja01152a551.
3. Kuwada, GT. A Prospective Randomized Trial Using Four Treatment Modalities for the Treatment of Plantar Fasciitis. August 2011, vol(4) Issue 8, No.11
4. Miller, RA., Torres, J., McGuire, M. Efficacy of first time steroid injection for painful heel syndrome. *Foot Ankle Inst.* 1995, 16 (10): 610-612.
5. Kline, A; Plantar Fascial Rupture of the Foot: A case report. *The Foot and Ankle Online Journal* 2 (5): 4 May 2009; pp 1/22-5/22.
6. Saxena, Amol; Fullem, Brian; Plantar Fascia Ruptures in Athletes. *Am J. Sports Med* April 2004 vol.32 no. 3; pp 662-665.
7. Williams, Bruce; Plantar Fascia Rupture. *Boston Sports Medicine and Performance Group, LLC Blog* on Mon, Apr 29. 2013 at 07:44 am.
8. Sabir, N.; Demirlenk, S; Yagci, B; Karabulut , N; Cubukcu, S. Clinical utility of sonography in diagnosing plantar fasciitis. *J Ultrasound Med.* 2005 Aug; 24(8):1041-1048.
9. Steinborn, M; Heuck, A; Maier, M; Schnarkowski, P; Scheidler, J; Reiser, M. MRI of plantar fasciitis. *Germany, Rofo.* 1999 Jan.; 170(1): 41-46.
10. Fabrikant, JM; Park, TS; Plantar Fasciitis (Fasciosis) Treatment Outcomes Study: Plantar fascia Thickness Measured by Ultrasound and Correlated with Patient Self Report of Improvement. *Foot (Edinb).* 2011, 21(2):79-83.
11. Kuwada, GT. Gormley, J. Retrospective Analysis of Calcaneal spur removal and complete fascial release for the treatment of chronic heel pain. *J. Foot Surgery.* 1992: 31(2): 166-169.