Baxter's Nerve Release after Suggestion of Entrapment via MRI by Atrophy of Abductor Digiti Minimi

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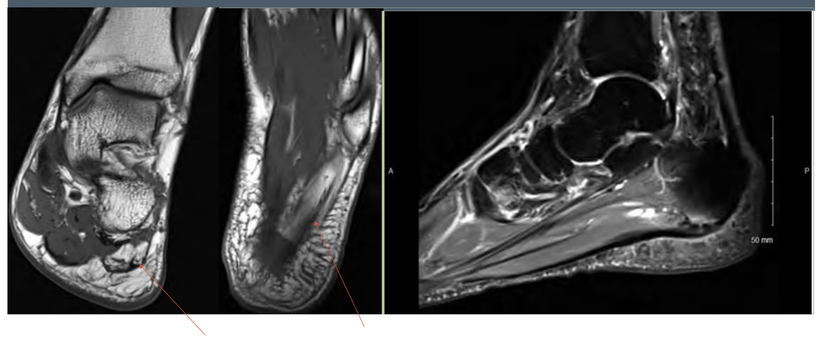
PURPOSE

The purpose of this poster is to describe the diagnostic approach and surgical procedure for a patient with Baxter's nerve entrapment.

CASE STUDY

This is a 65 y/o male with NIDDM who presented to our clinic for a second opinion after failing two years of conservative treatment for plantar fasciitis of the left foot. The patient has tried stretching, inserts, NSAIDs, PT, CAM boot, night splint, injections, had an MRI which confirmed plantar fasciitis, and had no surgical procedures to address this before-hand. On my exam the patient had a positive Tinnell's sign and a negative calcaneal squeeze test. Nerve Conduction Velocity studies were done on the patient which came back negative for abnormality. The MRI radiology read and previous providers unfortunately missed the fat infiltration to the Abductor Digiti Minimi and atrophy of good muscular tissue which Baxter's nerve innervates. In order to address this a Baxter's nerve release was done where the deep fascia where the nerve runs was opened and allowed for the nerve to course with no pressure. The patient had incisional pain for a few weeks as well as a distal area of the incision which was slow to heal. However, the pain which the patient had in his heal for the past two years was completely gone and at this time he is pain free.

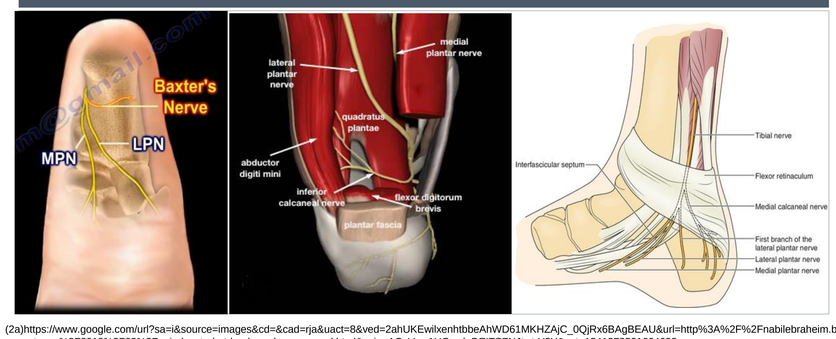
FIGURE 1a, 1b, 1c – PRE-OPERATIVE IMAGING



Surgical Technique

The surgical technique for this procedure begins at the distal aspect of a tarsal tunnel release where you can make an oblique or vertical incision over the first branch of the lateral plantar nerve. Dissection is carried down to the deep fascia which can be cleaned with a wet sponge. Using hemostats the deep fascia can be elevated and cut. The inferior extensor retinaculum comes into view at this point, and you can release the retinaculum at the most distal aspect for a partial tarsal tunnel release. Because the nerve typically branches while it is in the tarsal tunnel this is a good idea. The abductor hallucis muscle belly is then distracted down and the fascia from the abductor hallucis and quadratus plantae can be visualized and should be carefully released. Once this is completely released, the abductor hallucis muscle belly is retracted dorsally and any fascia that is not able to be relased from the previous step is usually able to be cut. Also, at this time the fascia of the quadratus plantae and the flexor digitorum brevis can be seen and should also be freed and released. At this time a cut can be made into the plantar fasica to produce a fasciotomy or a fasciectomy. Deep closure is usually avoided and skin closure is performed according to surgeon preference. [1,2]

FIGURE 2a, 2b, 2c – Baxter's Nerve



(2a)https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwilxenhtbbeAhWD61MKHZAjC_0QjRx6BAgBEAU&url=http%3A%2F%2Fnabilebraheim.blogspot.com%2F2018%2F03%2Fpain-located-at-heel-can-have-several.html&psig=AOvVaw1HGawlsOEITSZNJtwtrY3Y&ust=1541272521664623

(2b) https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwjbkuPMt7beAhVE6VMKHU8-Di8QjRx6BAgBEAU&url=https%3A%2F%2Fwww.fasciitis.com%2Fplantar-fasciitis-diagnosis%2Fbaxters-entrapment%2F&psig=AOvVaw1HGawlsOEITSZNJtwtrY3Y&ust=1541272521664623

(2c) https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiOwtHIwLbeAhUG7VMKHTtxCFwQjRx6BAgBEAU&url=https%3A%2F%2Fclinicalgate.com%2F94-tibial-neuropathy-tarsal-tunnel-syndrome%2F&psig=AOvVaw1HGawlsOEITSZNJtwtrY3Y&ust=1541272521664623

RESULTS & DISCUSSION

Plantar fasciitis is a very common ailment which podiatric surgeons treat on a daily basis. This is intended to describe a case of a patient who had symptoms and signs of plantar fasciitis and was treated for two years in duration however ultimately had different pathology. It is taught many times in school that some of the most common differential diagnoses for plantar fasciitis is calcaneal stress fracture and Baxter's nerve entrapment[3]. Doing a thorough physical exam and having advanced imaging in the form of an MRI will typically be able to differentiate these three processes. It is of note that Baxter's nerve is deep to the large Tibial nerve and also much smaller and therefore many times NCVs as well as EMGs will not be abnormal and be of little value[3]. If they are abnormal this would be more of a consideration of a tarsal tunnel syndrome in which the surgical option would be a full tarsal tunnel release. Since Baxter's nerve is the motor nerve of the Abductor Digiti Minimi[3], fat infiltration and atrophy to this muscle alone suggests nerve damage to this nerve alone and an isolated Baxter's nerve release can be performed[4]. In this case, the patient has been pain free now for approximately 1.5 years.

REFERENCES

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