Case Series

Clinical Outcome of Simple Surgical Excision of Accessory Navicular Bone in Patients With Failed Conservative Treatment

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Abstract

Objective: To describe the clinical outcome of simple surgical excision in accessory navicular bone.

Methods: This prospectively case series reviewed the results of 16 consecutive patients (17 feet) who underwent surgical treatment for symptomatic accessory navicular. The patients ranged in age from 16 to 25 years (average, 20.5 years; mean, 16.8 years) at the time of surgery. All patients had a type II accessory navicular. The study was conducted from January 2015 to February 2017. VAS system was used to evaluate the pain intensity pre and post operatively.

Results: The average preoperative VAS score was 6.24±0.83. The average postoperative VAS score was 0.94 ±0.83. Postoperatively, all the feet were pain free except one, no patient had decreased activity due to pain ,one patient required re-do surgery. Midfoot longitudinal arch alignment remain unchanged in our study postoperatively.

Conclusion: Surgical management gives promising results in patients who have failed conservative treatment initially. Overall, the procedure (simple surgical excision) of our study resulted in symptomatic relief and return to normal daily activities postoperatively.

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Introduction

Accessory navicular bone causes pain, tenderness and discomfort. Initially Bauhin used the term accessory navicular in 1605[1,2], later Von lushka described it as 'joint like'' after finding it in a young patient bilaterally; he also described its relation with posterior tibial tendon for the first time[3]. The study kept evolving and in the early literature accessory navicular was being described as sesamoid bone, accessory scaphoid, prehallux, navicular secundum and Os Tibiale externum. Froleich in 1909 said that accessory navicular produces flatfoot, he was of the opinion that simple surgical excision is enough to relieve the symptoms. Later on, Kidner hypothesized that accessory navicular causes medial displacement of posterior tibial tendon and recommended more complex procedure that included excision of navicular bone as well as re insertion of tendon to the bone, [2,3,5].

Both the surgical procedures; Kidner as well as simple excision are being used for the treatment but still simple excision is the most common surgical procedure and e ectively relieves the pain.

The foot and ankle have numerous accessory ossification centres, but the most common is accessory navicular bone occurring between 4-14% of population in adolescence, in children the incidence is 4-21%. Accessory navicular has three characteristic types, type I is a well-defined, round shape that is completely separate from the true navicular bone. It is embedded in posterior tibial tendon and is 30% of all the accessory navicularis. Type II accessory navicularis are joined by 1-3mm synchondrosis to the navicular bone. Type II is the most common form (50-60%).Type III accessory navicularis are joined by a bony connection to the navicular bone having the least occurrence (10-20%).[5,7]

Presence of Pain and tenderness are the main complaints of accessory navicular. The symptoms can be addressed conservatively by shoe modification, physiotherapy, local and oral antinflammatory agents. When conservative measures fail, surgical treatment is recommended.

Materials and Methods

This prospective case series was conducted in Department of Orthopaedic Surgery and Traumatology, Unit-II of Mayo Hospital from January 2015 to February 2017.

All the cases presented to outdoor department with accessory navicular bone after failed conservative management for more than 3 months with physical therapy and analgesics were included in this study. The patient having age ranging from 15-25 years of age. All the cases with previous history of trauma or surgery performed on the foot with accessory navicular bone were excluded from the study. Preoperative anteroposterior, lateral and oblique x-rays were performed. Preoperative baseline pain according to visual analogue scale (Fig.1) were calculated. All these cases were inducted in the study only after the ethical approval from institutional review board and availability of consent from the participant.

Study was conducted on 16 patients having symptomatic accessory navicular bone. All surgeries were performed under general anesthesia or spinal anaesthesia in supine position and pneumatic tourniquet was used in all cases

After palpating the accessory navicular bone, a skin crease transverse incision of 2-3 cm was used. After exposing the bone and retracting the posterior tibialis tendon, the accessory navicular was shaved o carefully from the navicular bone with a sharp osteotome. Wound was closed using prolene 2/0 after checking the posterior tibialis tendon. Post operatively X rays were taken and patient advised to have partial weight bearing till two weeks.

Mean follow-up period was 6 months. VAS score was used to quantify pain pre-operatively and post-operatively.

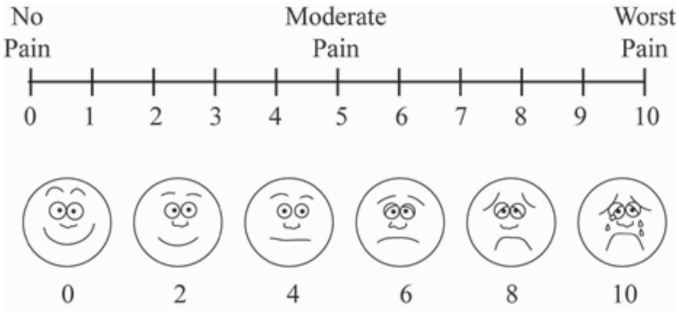

Fig. 1: *Visual Analogue Scale (VAS)*

Results

We had 16 patients with 17 feet with one of them having bilateral accessory navicular bone.

There were 10 (62.5%) female and 6 (37.5%) male patients. All of them had chief complaint of pain over the medial border of navicular bone specially while wearing closed shoes.The mean duration of pain in patient with type I accessory navicular bone was 4.25± 1.71 years while that in type II and III was 3.56± 1.81 years and 4.00± 1.55 years respectively.

The preoperative x-ray revealed four (23.5%) type I, 9 (52.9%) type II and 4 (23.5%) type III accessory navicular bone.

Mean preoperative pain according to visual analogue scale (VAS) was 6.25± 0.96, 6.22± 0.83 and 6.25±0.96 in type I, II and III accessory navicular bone respectively. The overall mean preoperative VAS was 6.24± 0.83 (5-7).

The mean postoperative VAS was 2.00 ± 0.82, 0.89± 0.33 and 0 in patient with type I, II and III accessory navicular bone respectively. The overall postoperative VAS was 0.94± 0.83.

There was statistically extremely significant

Table 1: *Demographic data of the patients in study*

SN	Types of Accessory Navicular Bone	Number of Patient N (%)	Gender distribution		Age (Years) Mean± SD	Preoperative VAS Mean± SD	Postoperative VAS Mean± SD
			Male	Female			
1	Type I	4(23.5%)	3	1	16.00± 1.41	6.25± 0.96	2.00 ± 0.82
2	Type II	8(23.5%)	0	8	19.00 ± 3.02	6.22± 0.83	0.89± 0.33
3	Type III	4(23.5%)	3	1	21.00 ± 1.83	6.25±0.96	0

improvement in VAS postoperatively with p-value being less than 0.0001.

There were two cases of postoperative superficial infectionsthat were managed with dressing and oral antibiotic according to culture and sensitivity.

Table 1 demonstrates the demographic data of the patients included in this study.

Discussion

Despite the incidence of accessory navicular of about 10-14% in normal population5, only 1% of the patients undergo surgical excision.[5,14].

Types of accessory navicular have been described depending on its relation to the navicular bone. In type I, it is embedded in posterior tibialis tendon occurring in the form of ossicle. Type II is the most common and it occurs in the form of synchondrosis having a fibro cartilagenous connection with the navicular bone in type III bony connection with the navicular bone is present[8,9,11]

The relationship of flexible flat foot and accessory navicular is now considered accidental, [13,14,15], though it was considered an established fact in the past.

At initial presentation conservative treatment by using non-steroidal anti-inflammatory (Oral and local applicant), immobilization in cast, orthoses, local steroid injection, and physical therapy is advised.

After failure of conservative modalities surgical treatment is treatment choice that is being practiced for years. There are di erent surgical techniques proposed for accessory navicular. These include simple excision of accessory navicular bone or another procedure that was described by Kidner and was named after him as Kidner procedure, it includes the excision of accessory navicular and re-routing the tibialis posterior tendon in more plantar position[5-6,9]. Percutaneous technique for accessory navicular excision has also evolved over past few years. Due to simple procedure and comparable results simple excision of navicular bone is still the choice of surgeons in many countries. The procedure has minor complications and e ectively reduces pain[14].

Barbara Jasiewiczet al5 have conducted a randomized clinical trial of 22 patients having accessory navicular bone. Total 34 feet were treated with simple surgical excision. The patients were followed-up to 20 weeks. Mean VAS results pre operative and post operative were 5.9 and 1.7. Complications were present in two patients (6.1%). Patients were returned to daily normal activities with good results.

Franz J et al[2] in a study of 13 patients (14 feet), average follow-up was 103.4 months. AOFAS midfoot scale was used to determine the outcome of surgery in this study. All the patients had satisfactory recovery and returned to daily activities, only one patient had post operative occasional pain that was relieved by analgesia.

In the current study, VAS was used to determine the quantitative outcome of 16 patients (17 feet) simple surgical excision of the accessory navicular. Return to normal activities without pain was our goal of treatment. The pain improved in VAS scalefrom a preoperative score of (6.24+0.83) postoperative score of (0.94+0.83) ($p < 0.5$). All 17 feet had an improvement in pain, 16 feet had no pain at all postoperatively. Only one of 17 feet required re operation. Over all. All patients reported pain relief and satisfaction with the surgery results.

The main drawbacks of our study were lack of a control group, small sample size and short follow-up period.

Conclusion

Treatment of symptomatic accessory navicular after failed conservative treatment with simple surgical

excision gives satisfactory outcome in terms of pain relief and Kidner procedure doesn't confer any significant results over simple excision. A longer follow-up with great number of sample will help establish the e cacy of this procedure and thus further study is required.

References

1. Mansoor SN, Rathore FA. Symptomatic accessory navicular bone: a case series. Egypt Rheumatol 2017; 39: 263–6.
2. Tuthill HL, Finkelstein ER, Sanchez AM. Imaging of tarsal navicular disorders: a pictorial review. Foot Ankle Spec 2014;7(3):211e25.
3. Takahashi M, Sakai T, Sairyo K. Magnetic resonance imaging in adolescent symptomatic navicular tuberosity. J Med Invest 2014;61(1e2):22e7.
4. Vaughan P, Singh D. Ongoing pain and deformity after an excision of the accessory navicular. Foot Ankle Clin 2014;19(3):541–553.
5. Kim JR, Park CI, Moon YJ, Wang SI, Kwon KS. Concomitant calcaneo-cuboidcuneiform osteotomies and the modified Kidner procedure for severe flatfoot associated with symptomatic accessory navicular in children and adolescents. J Orthop Surg Res 2014;9:131.
6. Huang J, Zhang Y, Ma X, Wang X, Zhang C, Chen L. Accessory navicular bone incidence in Chinese patients: a retrospective analysis of X-rays following trauma or progressive pain onset. Surg Radiol Anat 2014;36(2):167–72.
7. Huang J, Zhang Y, Ma X, Wang X, Zhang C, Chen L. Accessory navicular bone incidence in Chinese patients: a retrospective analysis of X-rays following trauma or progressive pain onset. Surg Radiol Anat 2014;36(2):167–72.
8. Chong A, Ha JM, Lee JY. Clinical meaning of hot uptake on bone scan in symptomatic accessory navicular bones. Nucl Med Mol Imaging 2016;50 (4):322–8
9. Abourazzak FE, Shimi M, Azzouzi H, Mansouri S, El Mrini A, Harzy T. An unusual cause of medial foot pain: the cornuate navicular. Eur J Rheumatol 2015;2(1):33–4.
10. Takahashi M. Magnetic resonance imaging in adolescent symptomatic navicular tuberosity. J Med Invest. 2014;61(1–2):22–7.
11. Cha SM. Simple excision vs the Kidner procedure for type 2 accessory navicular associated with flatfoot in pediatric population. Foot Ankle Int. 2013;34(2):167–72.
12. Pretell-Mazzini J. Surgical treatment of symptomatic accessory navicular in children and adolescents. Am J Orthop (Belle Mead NJ). 2014;43(3):110–3.
13. Vaughan P, Singh D. Ongoing pain and deformity after an excision of the accessory navicular. Foot Ankle Clin. 2014;19(3):541–53.
14. Ricco AI, Richards BS, Herring JA. Disorders of the foot. In: Herring JA, editor. Tachdjian's pediatric orthopaedics. 5th ed. Philadelphia: Elsevier Inc.; 2014; p. 233-9.
15. Kim JR. Concomitant calcaneo-cuboid-cuneiform osteotomies and the modified Kidner procedure for severe flatfoot associated with symptomatic accessory navicular in children and adolescents. J Orthop Surg Res. 2014;9:131.