Kidner Operation in the Treatment of Prehallux

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ABSTRACT: The clinical results of Kidner operation in ten patients who suffered from symptomatic prehallux at an average period of five years after the operation were reported. Nine surgical specimens were type II accessory navicular. There was abnormal insertion of the posterior tibial tendon found intraoperatively in all cases. At final review, all patients were asymptomatic and improved their gait subjectively. There were no surgical complications.

Kidner operation is a useful surgical procedure in prehallux when the conservative management fails.

Accessory tarsal navicular is a supernumerary bone originally identified by Bauhin[1] in 1605. Geist in 1914 and 1925 described the accessory navicular as occuring in 10 to 14 per cent of normal feet.[2] He was the first to classify this into two forms. One was a small, round sesamoid bone without attachment to the navicular and was actually within the posterior tibial tendon. The second was an accessory bone that articulated with the body of the navicular by either a synchondrosis or dense fibrocartilage. Zadek[1] in 1948 and chater[2] in 1962 also supported this classification. Sella[3] in 1986 again described the three types of accessory navicular by adding type III which represents an accessory navicular that was united with the navicular by a bony bridge, producing a cornuate navicular.

Kidner in 1929 discussed the relationship of flatfoot in the presence of a prehallux or accessory navicular and stated that there was an lateration of the line of the posterior tibial tendon as a result of the prominence of the prehallux. This resulted in decreasing the support of the longitudinal arch and an impingement of the accessory navicular against the medial malleous causing pain. He advocated removal of the prehallux an transplantation of the posterior tibial tendon to the supported Kidner's contention and reported satisfactory results in restoring the longitudinal arch and correcting heel valgus. However, Veitch,[5] Sullivan[2] and Gianestras[6] believed that the accessory navicular plays no role in the development of a flatfoot. Simple excision of accessory navicular without transplantation of the posterior tibial tendon seems to be the surgical procedure of choice when conservative means of management fail.

There is no commonly accepted standard treatment of the prehallux. The purpose of this article is to review our experience in the treatment of the prehallux by Kidner operation. It is hoped that some useful informations from this article will help us to determine the place of Kidner operation.

MATERIALS AND METHODS

The charts and radiographs of all patients who had a Kidner operation performed by the author between 1978 and 1987 were reviewed. The operation was performed on the feet: six right, four left; which belonged to three males and seven females. The ages of the patients at the time of operation ranged from eleven years to thirty-four years, with an average of twenty-two years. The average follow up was five years with a range of one year to nine years. (Table 1) All patients were operated upon at Ramathibodi Hospital, Mahidol University, Bangkok. All patients had a diagnosis based upon physical examination and radiographic study. A standing antero-posterior and lateral radiograph of the foot was made and closely examined for the type of the accessory navicular, for an alteration of the angle especialling in the calcaneal dorsiflexion and for talar plantar flexion angle on the lateral projection (Figure 1) Clinical and functional evaluation were assessed post operatively.

The main indication for operation was pain over the prominece of the medial aspect of the foot. Most patients also complained of fatique of the leg following an increase in activities. Surgery consisted of an excision of the accessory navicular together with an excess portion of the navicular that protrudes posteromedially. The posterior tibial tendon was transfered underneath the plantar surface of the navicular by suturing the tendon to

TABLE 1
Details of 10 Patients Having Kidner Operation Including Radiographic Feature.

Case number	Age (years)	Sex	Follow up (years)	Roentgenogarphic Feature			
				Type of accessory navicular	Articulating surface	Calcaneus dorsiflexion angle	Talar plantar flexion angle
1	27	F	6	II	Irregular	15	25
2	24	M	1	II	Smooth	22	29
3	32	F	8	II	Irregular	12	30
4	20	F	7	II	Smooth	10	34
5	12	M	7	II	Irregular	7	20
6	25	F	9	II	Irregular	16	20
7	12	M	1	III	–	10	26
8	26	F	1	II	Smooth	10	25
9	11	F	1	II	Irregular	10	39
10	28	F	5	II	Smooth	12	32

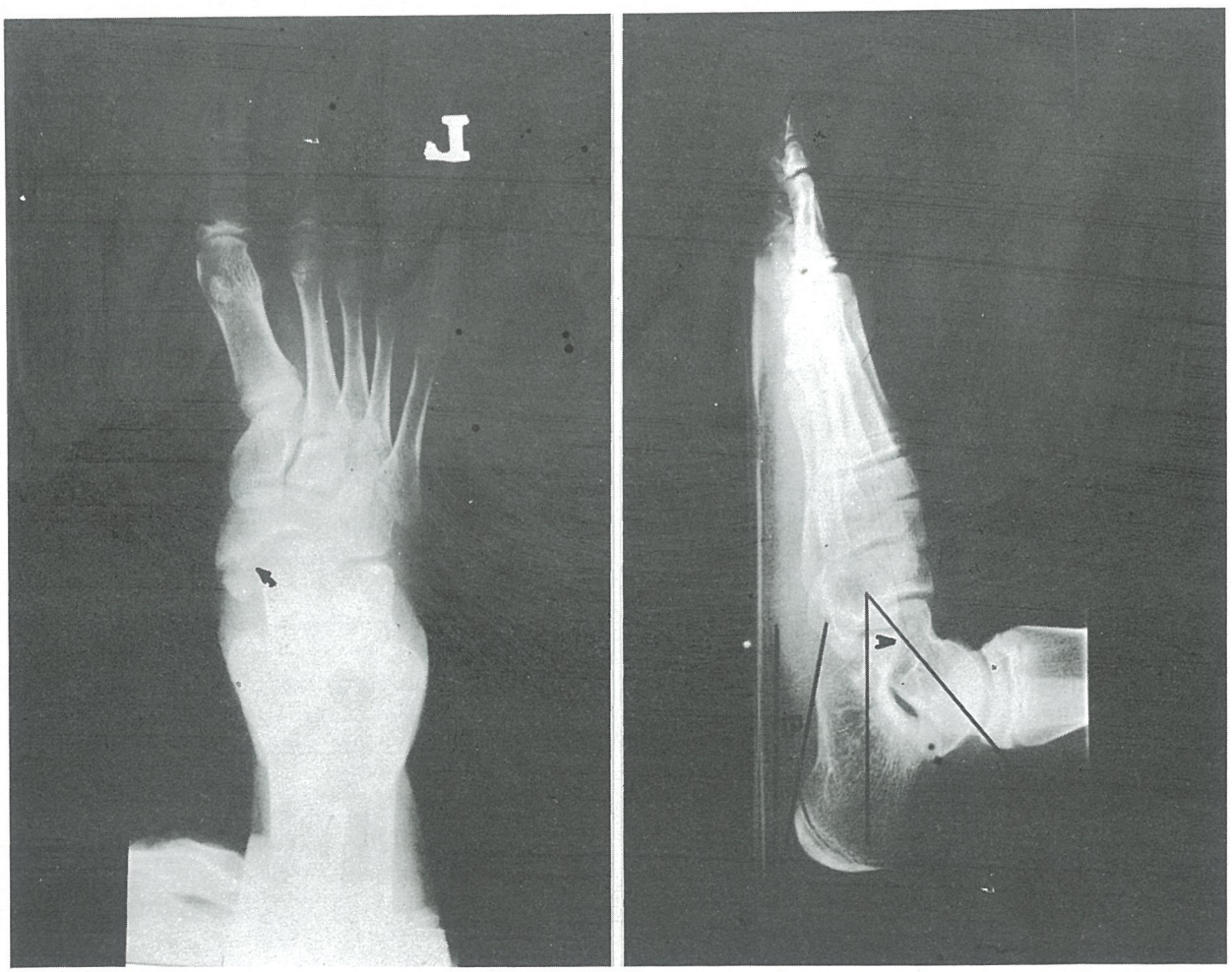

Fig. 1: A, Anteroposterior radiograph demonstrating the type II accessory navicular with irregularity of the articulating surface. B, Lateral radiograph demonstrating the calcaneal dorsiflexion (A) and talar plantar flexion angle (B).

the periosteum. After surgery, the foot was placed into a non-weight bearing cast for theree weeks and partial weight bearing with crutches for another three weeks. Thereafter, shoes with a medial arch support are recommended for several months.

RESULTS

Preoperative evaluation

All patients presented with pain at the medial side of the foot and most of them also complained of fatique of the leg and foot after prolong standing or working. These symptoms were present for at least one year prior to initial clinical evaluation. There was no specific history of injury or trauma to all the feet. Physical examination revealed a prominence over the medial side of the foot which was tender on deep palpation in all cases. All patients demonstrated flattening of the longitudinal arch with eversion of the heel on weight bearing except one case (case 2) who had a normal looking arch. No restriction of subtalar motion and heel cord contracture were noted. Analysis of the foot radiographs is summarized in Table 1.

Intraoperative evaluation

There was an abnormal insertion of the posterior tibial tendon into an accessory navicular in all cases. All excised accessory navicular were type II except one which was a type III. Five surgical specimens showed evidence of wear and tear on the articulating surface of the accessory navicular which corresponding to the radiographic finding (Figure 2).

Postoperative evaluation

At final review, all patients were symptom free. The pain over the medial aspect of the foot was disappeared. They were able to walk and stand without fatique at the time of follow up and also had a felling of good grip of the foot during stance phase especially push off. There was, however, no evidence of improvement of the longitudinal arch clinically. There were no complications from the operation. At present, all patients are suffering no pain, wearing a normal shoes and enjoying normal physical activity.

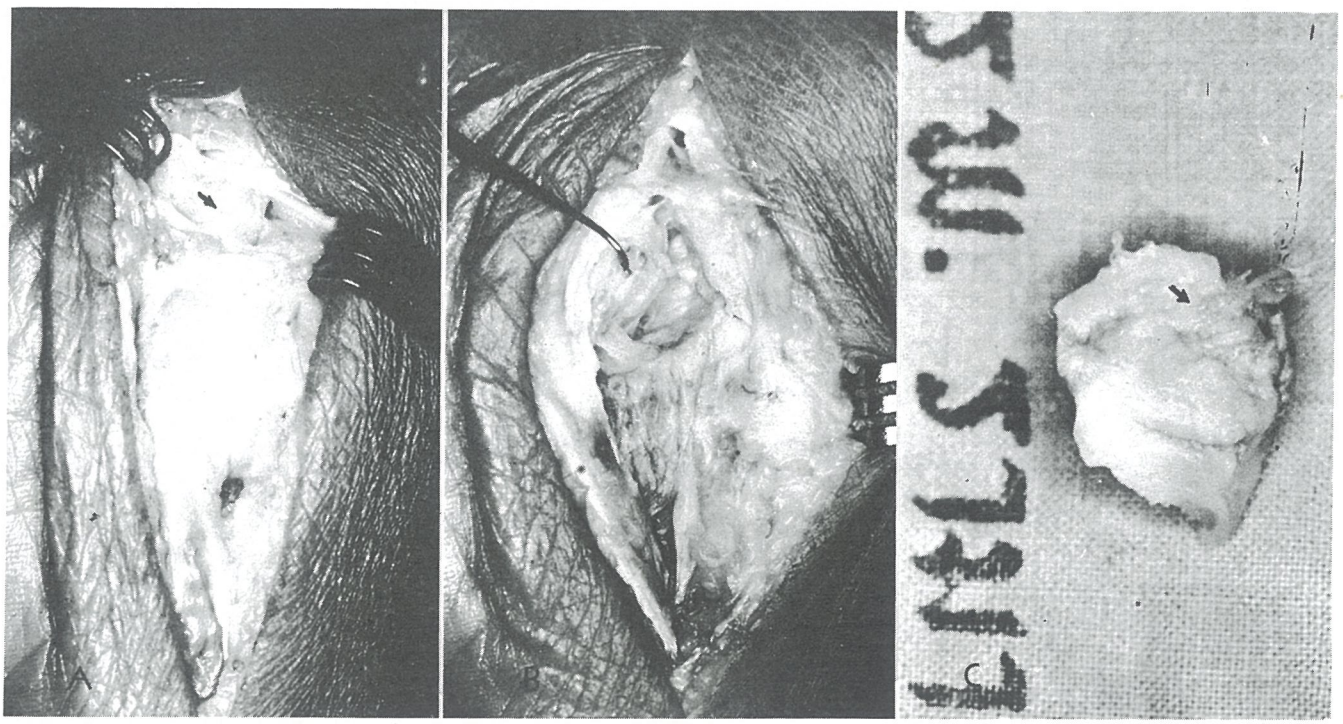

Fig. 2: A, B, Intraoperative picture of the posterior tibial tendon and the accessory navicular showed the insertion of the tendon on the lateral side of the accessory navicular and became more adductor. C, A surgical specimen of an accessory navicular showed evidence of wear and tear on the articulating surface.

DISCUSSION

The difinition of a normal medial longitudinal arch is poorly defined and there is no commonly accepted standard of making a diagnosis of a flatfoot by either clinical or radiographic means. Most people use clinical impression, foot-print and radiographic measurements to make a diagnosis. Bleck[7] reported the nromal angle of talar plantarflexion and calcaneal dorsiflexion were 26.5 and 16.8 respectively. Although the number of patients was small in this study the values of calcaneal dorsiflexion angle of all patients were below normal mean (16) except one (case 2) who had nromal looking medial longitudinal arch (calcaneal dorsiflexion 22). Throughout the medical literature there have been many theories as to the aetiology of flatfoot. Zadek and Kidner emphasised the relationship of the accessory navicular to the posterior tibial tendon and recommended removal of the accessory navicular with transposition of the posterior tibial tendon as mentioned earlier. He also recommended the operation should be performed in the patient before the age of 10 years. However, there is a great deal of controversy as to the aetiology and to the management of this condition. Sella believed that trauma to the synchondrosis of type II accessory naviculars can be the source of pain and recommended en bloc excision of the accessory navicular without transposition of the posterior tibial tendon. In this study, the symptoms were associated with the prominence of the accessory navicular which was type II in most of the cases. There was also a definited evidence of an abnormal insertion of the posterior tibial tendon which altered the line of pull of the tendon to become more adductor. This resulted in decreasing the support.of the longitudinal arch and increasing stress at the articulation of the accessory navicular, causing wear and tear on the articulating surface as shown radiologically and intraoperatively in 5 patients. In follow up, all patients were asymptomatic and felt that their gait were improved although there was no difference between the longitudinal arch of the feet pre and post operatively. The author personally believed that the arch of the foot depended chiefly upon the design of the tarsal bone and the support of the ligaments. Muscles were concerned solely with balance and protection of the bones and ligaments from abnormal stress. Therefore, it is likely that transposition of the posterior tibial tendon may play a role in improving the stability of the foot. Furthermore, the technique of the operation was simple. Based on the finding, when conservative measures fail, Kidner operation should be the surgical procedure of choice.

CONCLUSSION

Ten patients with symptomatic prehallux were treated by Kidner operation and the results of the operation were reviewed. In nine patients lost of the longitudinal arch of the foot with weight-bearing was noted clinically and radiologically. Nine excised accessory navicular were type II with evidence of wear and tear on the articulating surface in five specimens. There were definitely abnormal insertion of the posterior tibial tendon on the necessory navicular in all cases. There was no difference between the longitudinal arch pre and post operatively but all of them were symptom free and improved the gait post operatively. Therefore Kidner operation should be the surgical procedure of choice when consevative means of treatment fail.

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