

## Case report

# Salvaging of a failed Lapidus procedure by the soft tissue osteodesis procedure: A six-year follow-up case report



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## ABSTRACT

Soft tissue approach to hallux valgus deformity correction has not been popular due to concerns of its effectiveness. Osteodesis procedure is a soft tissue technique that has been reported with favorable results, especially its long term deformity recurrence rate was very low. Recurrence complication after Lapidus procedure has seldom been reported and its remedial surgery not much discussed yet. Soft tissue approach has never been recommended or reported for salvaging failed hallux valgus surgery. This case report is a failed Lapidus procedure due to symptomatic recurrence of deformity that was successfully salvaged by osteodesis procedure and followed up for six years to ensure no late symptoms and deformity recurrence.

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## 1. Introduction

Metatarsus primus varus (MPV) deformity has been regarded as the main underlying cause of hallux valgus (HV) deformity [1]. Hence, its correction has been the main objective in HV surgeries. MPV correction has been mostly achieved by osseous approach such as osteotomy and arthrodesis procedures [2,3]. Lapidus procedure [4] to fuse first metatarsal base to its surrounding bones has been recommended for severe MPV deformity [5], MPV deformity with hypermobile first metatarsal [6] and salvaging failed HV surgeries [7]. However, failure after Lapidus procedure due to MPV recurrence is still possible [8–10]. Its remedial surgery of choice has been either first metatarsal osteotomy or revision of the arthrodesis. No soft tissue technique has been recommended or reported to do so.

Osteodesis procedure is a soft tissue technique that has been reported with favorable results [11–15] in not only MPV deformity correction by its intermetatarsal cerclage suture technique but also its deformity recurrence prevention by its intermetatarsal fibrous bonding concept. This case report is for the first time to demonstrate that a failed Lapidus procedure could be successfully salvaged

by a soft tissue technique and followed up for 6 years to show no signs of recurrence.

## 2. Case report

A female high school student who had had recurrent pain and blisters of her left foot bunion, bunionette and lesser toes in wearing leather school shoes. Her foot X-ray (Fig. 1) in 2003 showed a metatarsus primus varus (MPV) deformity with an intermetatarsal angle (IMA) at 17.6° and her right foot at 15.2°. She underwent apparently a Lapidus procedure by percutaneous screw fixations without bone grafting and an open bunionectomy procedure at the age of 15 years in 2005 by her orthopedic surgeon in another hospital. Early postoperative X-ray (Fig. 2) showed incomplete MPV correction of IMA at 11.7°. Three months later the basal intermetatarsal transverse screw was removed (Fig. 3) to alleviate a persistent postoperative mid-foot weight-bearing pain. As her left mid-foot pain reduced, her original bunion deformity and pain recurred. Her contralateral right hallux valgus foot had also become increasingly more painful from walking in an expansive and hilly university campus. When conservative measures by orthopedic shoes and foot orthotics had become less effective and also no longer acceptable by her increasing fashion consciousness, repeat surgical correction of her left foot by first metatarsal osteotomy was recommended by her original surgeon but rejected by her. In 2008 she was referred to the author for further management.

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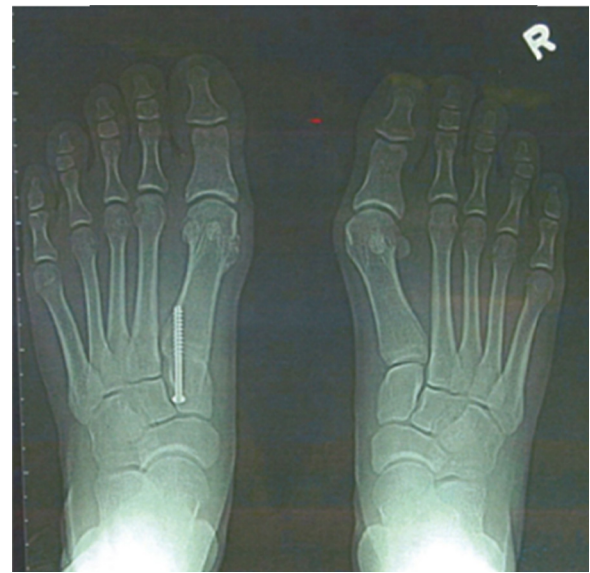


**Fig. 1.** Pre-treatment standing X-ray: 13-year old girl with severe left metatarsus primus varus (MPV) deformity of intermetatarsal angle (IMA) at 17.5°.

Examination of her feet at the time revealed bilateral hallux valgus deformity (Fig. 4a) and calcaneal valgus (Fig. 4b). First metatarsal of her untreated right foot was hypermobile in both transverse and sagittal planes, but her left foot first metatarsal was less mobile. There was respective 90 and 80° painless passive dorsiflexion movement of metatarsophalangeal joint of great toes. There was moderate amount of callus under medial aspect of great toes without pain. Standing X-ray examination (Fig. 4c) of her feet revealed complete fusion of metatarsocuneiform (MTC) joint of her left foot and its IMA had increased to 13.1°. Her right foot IMA had also slightly increased to



**Fig. 2.** Early post-Lapidus X-ray: showing good hallux and sesamoids realignment but mild residual MPV deformity of IMA at 11.7° after a percutaneous procedure.



**Fig. 3.** Post screw-removal X-ray: showing no noticeable change in deformities of left foot.

16°. Due to her rejection of osteotomy procedures she was offered the non-osteotomy soft-tissue technique that was called osteodesis procedure and it had been reported with high successful rate for primary metatarsus primus varus and hallux valgus deformities correction. Therefore, she also decided to undergo the same procedure for her right foot at the same time as her left foot and with the understanding that this soft tissue technique had never been reported for salvaging failed Lapidus procedures.

The osteodesis technique has previously been reported [13–15] and the same was applied to both of her feet under general anesthesia. The distal first intermetatarsal space was explored through a one-inch long dorsal incision. The interosseous muscle was partially resected and then retracted laterally to expose the lateral aspect of first MPJ and lateral conjoint tendon. A distal lateral soft tissue release of lateral collateral and lateral metatarsosesamoid ligaments were sufficient to correct her hallux valgus deformity without releasing the adductus hallucis tendon. The distal one-third of first and second metatarsals was then exposed subperiosteally and their opposing cortices were scarified with osteotome. Three drill holes of 2 mm in diameter were made in the distal third region of first metatarsal about half centimeter apart in the dorsoplantar direction. Then double strand #1 PDS™ (Ethicon, Inc., a division of Johnson & Johnson, Somerville, NJ) sutures were passed through the drill holes and then wrapped around the neck of second metatarsal. The two metatarsals were then tied together with four knots for each suture (Fig. 5) and the wound was then closed in layers. After realignment of the first metatarsal, bunionectomy was then performed through a separate medial incision of only her right foot as her left foot had already undergone bunionectomy by its previous Lapidus procedure. For the first three-month postoperative protective period, patient was allowed to bear weight anytime as tolerated but required to wear custom-made total-contact removable polypropylene foot cast-brace (Fig. 6) and also advised to reduce her walking. For the second three-month postoperative period, she was allowed to return to normal walking in regular shoes but no sports and high-heels. Unrestricted shoes and activities were allowed as tolerated six months postoperatively after X-ray examination (Fig. 7) showing satisfactory first metatarsal alignment.

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