

# Mueller-Weiss Syndrome, a Rare Cause of Flatfoot: Case Report

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## Learning Point of the Article:

Awareness of Mueller-Weiss syndrome in flat foot, which is one of the differential diagnoses of flat foot and can be treated conservatively, if treated early.

## Abstract

**Introduction:** There are numerous causes of flatfoot, among them osteonecrosis of the navicular bone, a rare disease known as Mueller-Weiss syndrome, also leads to deformity

**Case Report:** A 53-year-old male presented to our Outpatient Department with pain and swelling over bilateral foot for 3 years with increased severity in the left. Physical examination as well as footprint revealed a bilateral flat foot, and there was tenderness as well as swelling over the dorsomedial aspect of bilateral foot. After a detailed physical examination and radiological assessment, the case was diagnosed as Mueller-Weiss syndrome. He was treated with non-steroidal anti-inflammatory drugs, custom ankle-foot orthotic brace for 6 weeks, and activity modification and symptoms were relieved and he was able to do daily activities without any discomfort.

**Conclusion:** MW syndrome is a rare condition, where conservative treatment provides better results if it is diagnosed and treated early, whereas late cases require surgical intervention.

**Keywords:** Flat foot, Mueller-Weiss syndrome, Osteonecrosis of navicular bone.

## Introduction

Progressive collapsing foot deformity (Flatfoot) is a complex pathology defined by the collapse of the medial longitudinal arch of the foot with continued progressive deformity of foot and ankle. It may start with only mild symptoms but can progress to a painful, debilitating, and dysfunctional flatfoot [1]. There are numerous causes of flatfoot, among them osteonecrosis of the navicular bone, a rare disease known as Mueller-Weiss syndrome, also leads to deformity [2]. Mueller-Weiss syndrome is a rare idiopathic degenerative disease of the adult where there is progressive collapse and fragmentation of navicular bone leading to mid and hindfoot pain and deformity [3]. It is characterized by

navicular compression and fragmentation between talar head and lateral cuneiform with talar head displaced laterally, causing hindfoot varus and flattened medial plantar arch leading to chronic dorsomedial midfoot pain on weight-bearing [4]. Radiologically, there will be decreased navicular size, a comma-shaped configuration, increased radiodensity, fragmentation, and medial or dorsomedial protrusion [5].

Initially, conservative management consists of non-steroidal anti-inflammatory drugs (NSAID) and activity modification with insoles, orthosis, and non-weight bearing cast. When prolonged conservative treatment is not relieving pain, surgery is indicated but it must depend upon severity of symptoms rather

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## Author's Photo Gallery



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**Figure 1:** (a) (left side – loss of arch). (b) (left side – footprint). (c) (Right side – loss of arch). (d) (Right side – foot print). Clinical and footprint.

than deformity [3]. Surgical intervention options include decompression and autologous bone grafting and talonavicular-cuneiform or Triple arthrodesis [6,7].

### Case Report

A 53-year-old male presented to our Outpatient Department with pain and swelling over bilateral foot for 3 years with increased severity in the left. The pain was dull aching and insidious in onset that exacerbated with weight-bearing activities. He gave no history of trauma, fever, weight loss, morning stiffness, and other joint pain.

Physical examination as well as footprint (Fig. 1a, b, c, and d) revealed bilateral flat foot and there was tenderness as well as swelling over the dorsomedial aspect of bilateral foot. The ankle and subtalar movement were within normal ranges and neurovascular status was normal in both feet.

The weight-bearing plain radiograph revealed decreased size of the navicular, a comma-shaped configuration, increased radiodensity, collapse of the lateral aspect of bone, and

dorsomedial protrusion (Fig. 2a, b, c, and d).

The following angles were measured on X-ray: Calcaneal inclination, Meary's angle, Talonavicular angle, and Talo Calcaneal Angle, showing abnormal value (Table 1).

After a detailed physical examination and radiological assessment, the case was diagnosed as Mueller-Weiss syndrome.

Conservative and surgical options were explained, and patients denied surgical intervention. He was treated with NSAID, a custom ankle-foot orthotic brace for 6 weeks, and activity modification.

The patient's symptoms were relieved and he was able to do daily activities without any discomfort.

### Discussion

Mueller-Weiss syndrome, spontaneous osteonecrosis of the tarsal navicular bone in adults, is an uncommon with the number of causes has been speculative, including Kohlers disease, primary osteonecrosis, biomechanical or traumatic causes, and navicular osteoarthritis [3]. Bilateral distribution of spontaneous osteonecrosis with less severe radiographic changes is usually seen and unilateral distribution is often associated with other causes [5].

The plantar pressure distribution in patients with Mueller-Weiss syndrome and normal individuals by Hetsroni et al. [8] concluded that Mueller-Weiss syndrome has increased plantar pressure at the midfoot combined with the reduction in toe pressure, which correlates with characterized navicular pathological changes. The radiographic finding is dorsal or dorsal medial protrusion of navicular bone with characteristic comma-shaped deformity due to collapse of the lateral portion of the bone [5]. There is no gold standard treatment for

	Left	Right
Calcaneum inclination (18°–22°)	5°	8°
Mearys angle (Talo – first MT) 0°	15°	12°
Talonavicular angle (7°)	20°	18°
Talo Calcaneal angle (lateral) 5°–25°	20°	40°
Talo Calcaneal angle (AP) 15°–30°	15°	45°

**Table 1: Angles measured on X-ray.**



**Figure 2:** (a) (left side) Comma Shaped Navicular. (b) (Right side) Comma-Shaped navicular. (c) (left side) Lateral Collapse. (d) (Right side) Lateral Collapse. Weight-bearing X-ray. (e) (left side) Dorsomedial Protrusion. (f) (Right side) Dorsomedial Protrusion. Weight-bearing X-ray.

Mueller-Weiss syndrome, as per the available literature, early-diagnosed is best treated with conservative therapy, whereas surgical intervention is considered for failure of conservative therapies. Later on, once symptoms are not relieved then percutaneous decompression of the navicular bone and excision of the bone and arthrodesis [9].

In the present case, patients were having pain and swelling over bilateral feet with X-ray finding, decreased size of the navicular, a comma-shaped configuration, increased radiodensity, collapse of lateral aspect of bone, and dorsomedial protrusion. These findings are consistent with that of Brailsford [4], Haller et al. [5], and Viladot et al. [10] supporting the diagnosis of Mueller-Weiss syndrome. Our patients were treated conservatively and improved in a few months and were able to perform daily activities without any discomfort.

### Conclusion

Mueller-Weiss syndrome should be considered in differential diagnosis of flat foot. Mueller-Weiss syndrome is a rare condition, where conservative treatment provides better results if it is diagnosed and treated early, whereas late presentation requires surgical intervention. Although further studies with a large number of case series and long-term follow-up are required to properly assess the best treatment modalities. This article attempts to bring awareness of Mueller-Weiss syndrome in flat foot.

### Clinical Message

Awareness of Mueller-Weiss syndrome, which is one of the differential diagnosis of flat foot and can be treated conservatively, if treated early.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil **Source of support:** None

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**Consent:** The authors confirm that informed consent was obtained from the patient for publication of this case report

### How to Cite this Article

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