I. Introduction
   A. Flatfoot presents as a wide spectrum of foot deformities exhibited by varying degrees of hindfoot valgus, forefoot abduction, and forefoot varus.
   B. Numerous combinations of bone and soft tissue procedures have been described to correct the different types of pes planovalgus deformities, and to address the varying amounts of rigidity in the hindfoot joints.
   C. Medial displacement calcaneal osteotomy, lateral column lengthening, and subtalar fusion all provide correction of heel valgus, and lateral column lengthening will correct forefoot abduction
      1. None of these procedures adequately address the fixed forefoot varus component of the deformity.
   D. Plantarflexion Opening Wedge 1st Cuneiform Osteotomy is a useful adjunctive procedure.
      1. corrects fixed forefoot varus component of the Acquired Adult Flatfoot Deformity
      2. most often combined with other operative procedures
      3. high union rate, minimal morbidity, and is performed with either allograft or autograft as an interposition bone graft material.
   E. Although the procedure was initially described over 70 years ago, there has been a renewed interest in this technique.
   F. Concept of the foot “tripod” – Three legged stool

II. Indications
   A. Forefoot varus with elevation of the medial column of the foot when the location of this deformity is at either the 1st metatarsocuneiform joint or the naviculocuneiform joints.
      1. The typical graft size that can be inserted into this opening wedge is 4 - 8mm.
      2. Mild to moderate degrees of deformity can be corrected.
   B. This osteotomy may also be utilized for “fine tuning” a triple arthrodesis which has been fixed with some residual slight forefoot varus by using the opening wedge to further plantarflex the 1st ray.

III. Contraindications
   A. Forefoot varus deformities in which the magnitude of the deformity is greater than what a 4-8 mm bone block can correct.
   B. Significant osteoarthritis at either the metatarsocuneiform joint or the naviculocuneiform joint (when fusion is better option for pain and deformity correction)
   C. Fixed deformity at the transverse tarsal joints or global forefoot varus at the naviculo-cuneiform joints since the deformity should then be corrected at these joints rather than more distally in the 1st cuneiform.
IV. Procedure
A. Dorsal incision over Cun-1
B. Develop interval between EHL (medial) and EHB (lateral) – watch for deep peroneal n.
C. Mark mid “waist” of cuneiform and check on C-arm
D. Make saw cut through cun.-1 leaving plantar cortex intact
E. Pry osteotomy open with small osteotome or use a distractor with one pin on each side of osteotomy
F. Measure gap when first ray corrected to desired level
G. Measure and cut tricortical (allograft, autograft, metal biofoam wedge) graft and tamp into gap
H. Fixation of bone graft with percutaneous K-wire (removed at 4-6 weeks). No need for more stable fixation unless plantar cortex of osteotomy is cut and osteotomy is unstable.
I. Shave off excess graft and dorsal prominence of surrounding cuneiform, pack graft into remaining gap

V. Results:
A. Approximately 8 degrees of angular change noted in the first cuneiform using an average of a 7 mm wedge block.
B. Uniformly consistent healing with allograft bone wedge

VI. Complications
A. Wrong choice of operation: Lack of adequate correction due to instability or significant deformity at the naviculo-cuneiform joint or due to global forefoot varus.
B. Dorsal cutaneous nerve injury: deep peroneal n or branches of superficial peroneal nerve
C. Hardware pain or prominence
D. Nonunion, delayed union (rare)

Bibliography: