Joint-Preserving Surgery of Valgus Ankle Osteoarthritis

Victor Valderrabano, MD, PhD[a,*], Jochen Paul, MD[b], Horisberger Monika, MD[b], Geert I. Pagenstert, MD[b], Heath B. Henninger, PhD[c], Alexej Barg, MD[b,c]

KEYWORDS

- Valgus ankle osteoarthritis • Supramalleolar osteotomy
- Lateral lengthening calcaneal osteotomy • Medial displacement calcaneal osteotomy
- Cotton osteotomy

KEY POINTS

- The most common cause of ankle osteoarthritis is posttraumatic, often resulting in a concomitant valgus or varus deformity of the hindfoot.
- There are 2 main etiologic and morphologic groups of asymmetric valgus ankle osteoarthritis: primary form and posttraumatic form.
- In patients with valgus hindfoot deformity the lateralized mechanical lower leg axis leads to overload of the lateral compartment of the tibiotalar joint.
- Diagnosis of valgus ankle osteoarthritis is based on careful clinical assessment and radiographic imaging including weight-bearing radiographs of the foot and ankle.
- Before considering joint-preserving surgery in patients with valgus osteoarthritic ankle all contraindications should be excluded.
- The aim of joint-preserving surgery is to realign the hindfoot and to normalize the heel contact point. Overall, in the current literature promising short-term and mid-term results have been observed in patients who underwent realignment surgery due to valgus hindfoot deformity.

INTRODUCTION

Osteoarthritis (OA) is a growing problem in health care worldwide. Approximately 1% of the adult population suffers from painful end-stage ankle OA,[1] but ankle OA is

The authors have nothing to disclose.

[a] Orthopaedic Department, Osteoarthritis Research Center Basel, University Hospital of Basel, University of Basel, Spitalstrasse 21, Basel 4031, Switzerland; [b] Orthopaedic Department, University Hospital of Basel, University of Basel, Spitalstrasse 21, Basel CH-4031, Switzerland; [c] Department of Orthopaedics, Harold K. Dunn Orthopaedic Research Laboratory, University Orthopaedic Center, University of Utah, 590 Wakara Way, Salt Lake City, UT 84108, USA
* Corresponding author.
E-mail address: victor.valderrabano@usb.ch

Foot Ankle Clin N Am 18 (2013) 481–502
http://dx.doi.org/10.1016/j.fcl.2013.06.008 **foot.theclinics.com**
1083-7515/13/$ – see front matter

significantly less common than in the knee or hip. However, the clinical importance of ankle OA should not be underestimated. Glazebrook and colleagues[1] have demonstrated that patients with end-stage ankle OA have mental and physical disability comparable with that of patients with end-stage hip OA.

The most common cause of ankle OA is posttraumatic, with around 80% of all incidences, followed by primary and secondary ankle OA.[2–4] The most common reason for developing posttraumatic ankle OA is a fracture of lower leg, but patients with repetitive ligamentous lesions and chronic ankle instability may also develop degenerative changes of the tibiotalar joint.[5] Patients with posttraumatic ankle OA typically present with asymmetric involvement of the tibiotalar joint, resulting in valgus or varus deformity of the ankle and hindfoot.[6] Without appropriate treatment, patients with asymmetric ankle OA typically develop full end-stage ankle OA in the mid or long term.[7,8]

Ankles with pathologic valgus deformities suffer from a lateral joint overload with subsequent lateral tibiotalar joint degeneration, which causes further lateral load shift (vicious circle).[7,9,10] In most cases the patients are younger than 50 years. More than half of the tibiotalar joint is typically preserved, so that joint-sacrificing procedures such as total ankle replacement or ankle arthrodesis may be not the most appropriate treatment options. In these cases patients may benefit from joint-preserving realignment surgery to unload the degenerated lateral area and normalize joint biomechanics. Short-term and mid-term results following realignment surgery are promising, with substantial postoperative pain relief and functional improvement that is reflected in high patient satisfaction.[8,11–13]

This article describes the authors' algorithm for the treatment of patients with asymmetric valgus ankle OA.

ETIOLOGY OF ASYMMETRIC VALGUS ANKLE OSTEOARTHRITIS

The etiology of asymmetric arthritic valgus ankles can be divided into 2 main etiologic and morphologic groups (**Table 1**).[14] The primary form of asymmetric valgus ankle OA is characterized by severe deformity of the pes planovalgus, with insufficiency of the medial ligaments and end-stage tibial tendon dysfunction (Grade IV using the Myerson classification).[14–19] Talocalcaneal and/or calcaneonavicular coalition may also be associated with asymmetric valgus ankle OA.[20] The second important etiologic category of asymmetric valgus ankle OA is posttraumatic. Osseous valgus deformities may result from severe ankle fracture with valgus impacted tibial plafond.[6,17,21] Moreover, patients with malunited fibula fracture with shortened and externally rotated fibula may present with asymmetric valgus ankle OA.[7,22,23] Chronic posttraumatic medial ankle instability is another etiologic factor in asymmetric valgus ankle OA.[5,24,25]

Table 1
Etiologic groups of asymmetric arthritic valgus ankles

Group	Etiologic Factors
Primary	Posterior tibial tendon dysfunction Grade IV Talocalcaneal and/or calcaneonavicular coalition Pes planovalgus deformity
Posttraumatic	Intra-articular ankle fracture with valgus impacted tibial plafond Fibular malunion with shortened and externally rotated fibula Chronic medial ankle instability