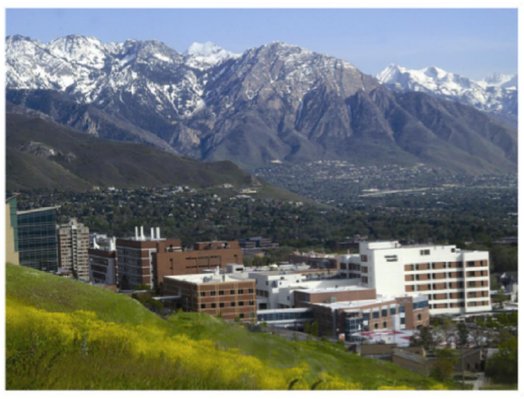

# Joint Preservation Post Ankle Arthrodesis in Hemophilia: A Review

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## INTRODUCTION

- Hemophilic arthropathy of the ankle leads to severe pain and ultimately ankylosis.
  - Surgical ankle arthrodesis (AA) is performed to eliminate pain.
  - Patients report concern for long-term health of adjacent joints of the foot/ankle post AA.

*Tibiotalar arthrodesis*

*Talocalcaneal arthodesis*

## OBJECTIVES

- The purpose of this paper is to provide recommendations for preservation of the adjacent joints of the ankle post-AA, based on a review of both the hemophilia and non-hemophilia literature.

## METHODS

- A literature search was conducted using various electronic databases and focused on published articles reporting outcomes related to long-term prognosis, gait and physical activity post AA, between the years 1980 and 2010.
- Fourteen articles consisting primarily of case reports and gait studies were reviewed.

## RESULTS

- Hemophilia literature outcomes included:
  - elimination of pain and recurrent hemarthroses
  - joint position was restored
  - quality of life was improved
  - stress on adjacent joints pos- AA became a concern
- Non-hemophilia literature outcomes included:
  - hind-foot arthritis developed in 15-60% of patients
  - gait studies showed:
    - hind-foot limitations were compensated for by increased motion in adjacent joints of the foot/ankle
    - decreased soleal activity from loading response to terminal stance biased the foot toward eversion
    - hip/knee kinematics improved compared to pre-AA gait
    - Shoes with a heel rise of ~2.5cm improved foot dynamics during gait

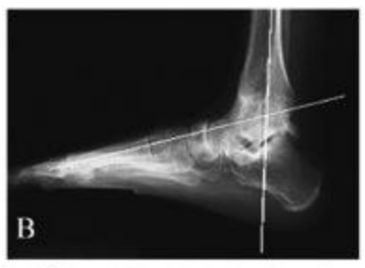


**Fig 1A–B.** Lateral radiographs show a foot with an ankle arthrodesis in (A) forced plantar flexion (B) and dorsiflexion. The average maximal foot and tibia plantar flexion and dorsiflexion were 17° and 7°, respectively.

"Rockers": Heel rocker occurs during weight acceptance (5˚ PF), ankle rocker occurs during first ½ of SLS (slight DF), forefoot rocker, and the 3rd rocker where GRF is at the met-heads, and when heel-off occurs (10˚ DF) at terminal stance f/b 15˚ PF (passive) at pre-swing. *(Placzek JD, 2006)*

During normal gait, ankle motion ranges from: 10˚ DF in mid-stance to 20˚ PF in pre-swing. *(Inman, 1981)*


**Fig 2.** An example of shoes modified by adding a (*) 2-cm high standard heel is shown. The shoe instep is the difference of sole height measured at the (1) heel level and the (2) metatarsal head level. Markers were put on the lateral malleolus (a) over the second metatarsal head (mh) and behind the heel (h).

## CONCLUSIONS

- This review of the literature suggests patients with hemophilia who undergo AA will have:
  - good pain relief early on
  - risk for deterioration of adjacent joints of the foot/ankle in the long-term
- Though adjacent joints of the foot/ankle following AA are at risk for degenerative changes, actions may be taken to prolong the health of the joints.
  - Patient education focusing on reducing everyday stresses on the foot/ankle should include:
    - avoiding running, jumping
    - limiting exercise, recreation and work related activities to those with minimal impact on the foot/ankle
  - Strengthen available plantar flexion/inversion
  - Implement a shoe with a heel rise to reduce stress on adjacent joints of the foot/ankle

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