Complications of the Calcaneal Osteotomy

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I. Anatomy

A. Lateral- Sural N. and branches, distally- peroneals
B. Medial- MPN, LPN, PTA- all close to osteotomy

II. Clinically Relevant Calcaneal Osteotomies

A. Tuberosity
   a. Oblique
      i. Medial displacement
      ii. Lateral displacement +/- closing wedge
   b. Malerba/Scarf
      i. Greater theoretical risk of NV injury

B. Lateral Column
   a. Just proximal to C-C joint
   b. Opening wedge

III. Tuberosity Osteotomies- Complications

a. Sural N. injury
b. Infection- standard risk
c. Nonunion- rare, compression at osteotomy site important
d. Loss of position-rare if surfaces opposed
e. Under correction
f. Overcorrection-rare, more often with medial translation
g. Medial sided (Tibial N.) injury- especially with lateral translation/closing wedge. Risk from saw/osteotome penetration, traction on nerve draped over osteotomy and/or also traction on calcaneal attachment of lacinate ligament causing decreased space in tarsal tunnel (Bruce). Greater theoretical NV risk from saw with Scarf
IV. Lateral Column Lengthening- Complications

a. Sural N. Injury-
   i. many branches by the time it is near C-C joint

b. Subtalar, anterior/middle facet “injury”
   i. The osteotomy frequently goes through ant./mid. facet (Brage)
   ii. is it clinically relevant?

c. Calcaneo-cuboid joint pain/ arthritis
   i. doubles contact forces (Iaquinto), how inevitable is arthritis?
   ii. LCL predispose to C-C joint pain?

d. Malposition
   i. Typically the distal side displaces superiorly. Draw a horizontal line across osteotomy site before making the cut and monitor it while opening the osteotomy. 11.8% dorsal displacement in Thomas study

e. Nonunion-
   i. 10% nonunion with ICBG, 0% with allograft and PRP (Walling)

f. Overcorrection with graft interposition-
   i. Hard to evaluate intra-op.- Simulate WB AP XR intra-op

g. Graft resorption
   i. Less so with allograft. ? wedges

h. Peroneal tendon injury- Brage study noted proximity to osteotomy
   i. Can be injured acutely with poor retraction/protection while sawing or can tear attritionally over hardware or boney edge

V. Ongoing discussion

a. Should we routinely release the tarsal tunnel with “valgusizing” hindfoot osteotomies?

b. Are limited/percutaneous approaches safer for tuberosity osteotomies?

c. Is doubling contact pressures at the C-C joint clinically relevant?

d. Allograft or metal wedge? Who will win the day?

e. Lateral “Z” osteotomy (Berlet)-greater control, fewer malunions/nonunions?

VI. References (annotated)

   All medial structures anatomically at risk as well as sural N and peroneal tendons. Osteotomy 10mm proximal to C-C joint best place to avoid anterior and middle facet although osteotomy frequently violated the joints.

A minimum of 2 neurovascular structures crossed the osteotomy site medially. Most common were lateral plantar N and branches and posterior tibial A. and branches


Allograft and PRP healed more predictably than Autograft


11.8% dorsal displacement


LCL causes double contact forces at C-C joint

Bruce, DiGionvanni CW. *The Effect of Medial and Lateral Osteotomies on the Tarsal Tunnel*. FAI 35(4) 2014

Lateral osteotomy fragment displacement significantly reduces tarsal tunnel space


NOTES