

Vascular Calcifications Predict Complications after Ankle Fracture Surgery: A Matched Cohort Study

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INTRODUCTION: Vascular calcifications are associated with chronic diseases known to impact healing after ankle fracture surgery. However, the presence of incidentally noted vascular calcifications on perioperative radiographs has not been studied as an independent risk factor for complications. The purpose of this study was to assess the relationship between calcifications and post-operative complications in patients undergoing ankle fracture surgery.

METHODS: Patients with unstable rotational ankle fractures treated at hospitals affiliated with an academic level 1 trauma center over a 5-year period were identified using ICD-10 codes. Perioperative radiographs of the foot and ankle were evaluated for presence of vascular calcifications. Patients with and without vascular calcifications were matched on demographic data, injury characteristics, and comorbidities such as diabetes, renal disease, peripheral vascular disease, smoking, and osteoporosis. Outcome data was then collected for each group.

RESULTS: Seven hundred fifty-two patients were treated surgically for unstable ankle fractures during the study period and were screened for inclusion. Twenty-nine patients eligible for inclusion were noted to have vascular calcifications on injury radiographs and were matched to a similar cohort of 29 patients without vascular calcifications. In the vascular calcification cohort, 6.9% of patients had superficial surgical site infections, 13.8% had other wound complications, and 10.3% had fixation failure requiring additional surgery. In the cohort without vascular calcification, none had superficial site infections, 6.9% experienced other wound complications, and none had fixation failure requiring additional surgery. The overall complication rate was higher in the vascular calcification group (37.9% vs. 13.8%, $p = 0.07$).

DISCUSSION AND CONCLUSION: Vascular calcifications seen on perioperative radiographs of patients with unstable ankle fractures are clinically significant independent risks for increased rate of postoperative complications. Surgeons should account for these calcifications on injury films and incorporate this information into patient counseling. Future ankle fracture studies should report on the presence or absence of vascular calcifications. Further study is warranted to determine which specific adverse outcomes are most strongly associated with calcifications, as well as opportunities to decrease risk in this patient population.