

Wound Complications in Calcaneus Fractures Treated with the Sinus Tarsi Approach:

Results in 164 Consecutive Fractures

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Disclosures

No Potential Conflicts to Disclose for this Lecture

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- Intra-articular calcaneus fractures are routinely treated with ORIF.
- The extensile lateral approach (ELA) is commonly used, but has wound complication rates up to 33%.
- An alternative is the sinus tarsi approach (STA) which is less invasive.

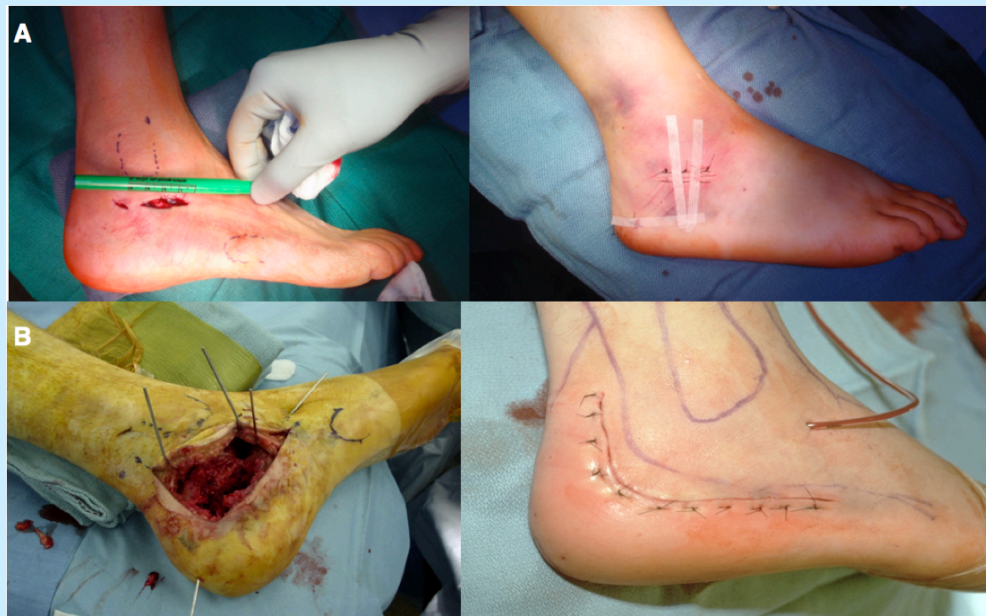


Figure 1. Photographs showing surgical approach and skin closure. (A) Sinus tarsi approach (B) Extensile lateral approach.

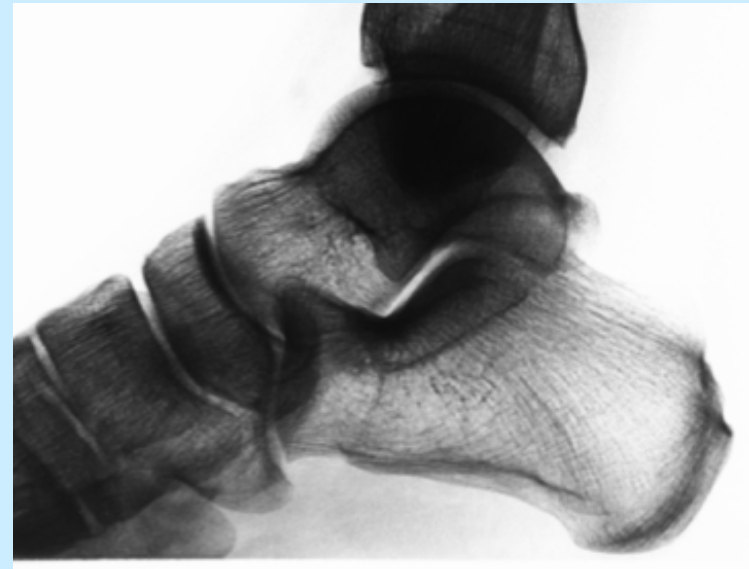
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Purpose

- This study evaluates the wound complication rate and associated risk factors in a consecutive series of 164 displaced, intra-articular calcaneus fractures treated with ORIF using the STA.



Injury X-ray



Contralateral X-ray

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Methods

- Retrospective review of the senior author's patient database
- All treated with ORIF via the STA by a single surgeon, fellowship trained in foot and ankle surgery
- 150 patients with a total of 164 displaced, intra-articular calcaneus fractures

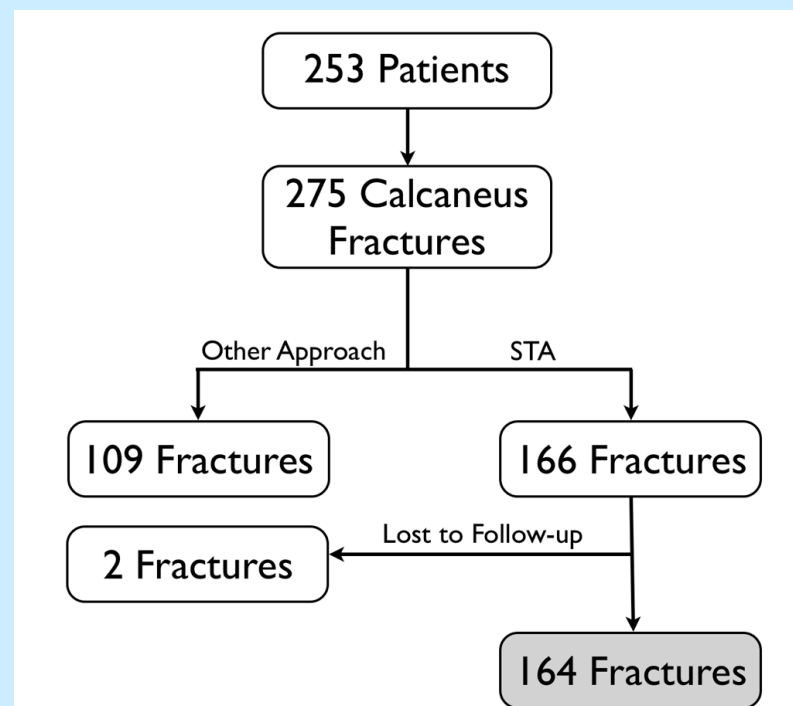


Figure 2: Patient inclusion selections

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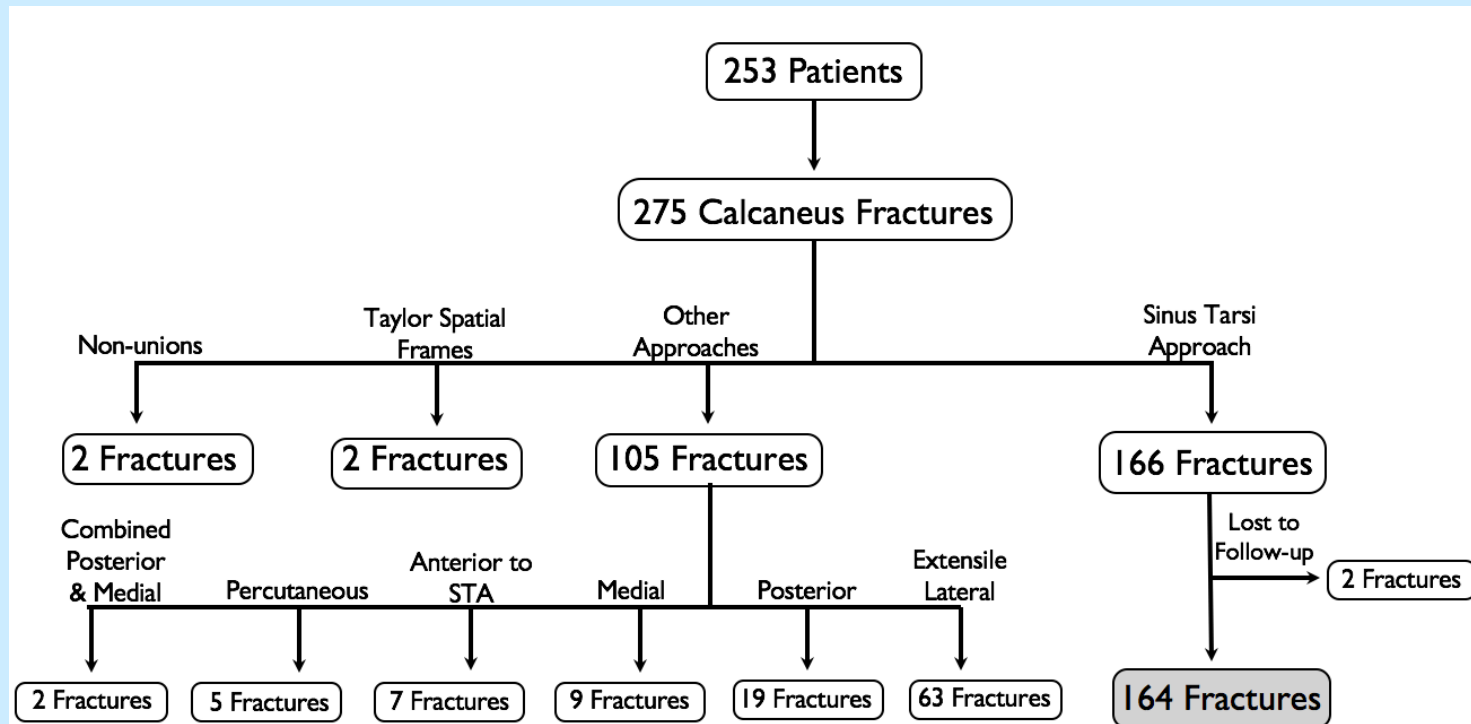


Figure 2: Patient inclusion selections

Table 1. The number of cases done pre and post 2010 based on incision type, demonstrating the transition from ELA to STA.

	July 2006 to 2010	2010 to March 2016
Sinus Tarsi Approach	24	142
Extensile Lateral Approach	54	9
Other Approaches	21	25

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Methods

- Pre-existing medical conditions, social history and wound complications requiring antibiotics, wound care or secondary surgery were noted.
- Dates of injury, surgery and last follow up were recorded.
- Chi-squared or Fisher's exact tests were used to determine associations between potential risk factors and wound complications.

Table 2. Patient Demographic Breakdown.

Average Age	49.5 years (10-88 years)
Male	122 (74%)
Smokers	64 (39%)
Diabetics	14 (8.5%)
Insulin Dependent Diabetics	3 (1.8%)
Steroids/DMARDs* users	6 (3.7%)
Open Fractures	8 (4.9%)
<14 days to Surgery	119 (72.6%)
Average Time to Surgery	10.6 days (0-47 days)
Average Follow Up	309 days

* Disease Modifying Anti-Rheumatic Drugs

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Results

- Overall rate of post-operative wound complications was 4.3%.
- Only one (0.6%) required operative intervention for a wound complications.

Table 3. Patients with wound complications.

Patient	Signs or Symptoms	Treatment	Surgery Required	Variables
1	erythema & serous drainage	Oral Antibiotics, wet to dry dressings [†]		Non-smoker, Diabetic , No Steroids/DMARDs*, Closed, <14 days to Surgery
2	erythema & skin breakdown	Oral Antibiotics, non-adherent dressings [§]		Smoker , Non-diabetic, No Steroids/DMARDs*, Closed, <14 days to Surgery
3 [‡]	serous drainage	Oral Antibiotics		Non-smoker, Non-diabetic, No Steroids/DMARDs*, Open , <14 days to Surgery
4 [‡]	serous drainage	Oral Antibiotics		Non-smoker, Non-diabetic, No Steroids/DMARDs*, Closed, >14 days to Surgery
5	erythema & incomplete healing	Oral Antibiotics, non-adherent dressings [§]		Non-smoker, Non-diabetic, No Steroids/DMARDs*, Closed, <14 days to Surgery
6 [‡]	serous drainage	Oral Antibiotics		Smoker , Non-diabetic, No Steroids/DMARDs*, Closed, <14 days to surgery
7	erythema, wound dehiscence, purulent drainage	Operative Intervention	Irrigation & debridement with primary closure	Smoker , Non-diabetic, No Steroids/DMARDs*, Closed, >14 days to Surgery

* Disease Modifying Anti-Rheumatic Drugs

[†]Sterile saline was used to dampen a sterile 4x4 gauze and applied to the wound. A dry 4x4 gauze was placed over this and then wrapped with an ace wrap. This was changed morning and evening.

[§]Adaptic with sterile 4x4 gauze was placed over the wound and wrapped with an ace wrap.

[‡]These patients were placed on antibiotics due to phone call to the on-call physician until such time as they could be seen in office. All 3 had their antibiotics discontinued upon evaluation in the office.

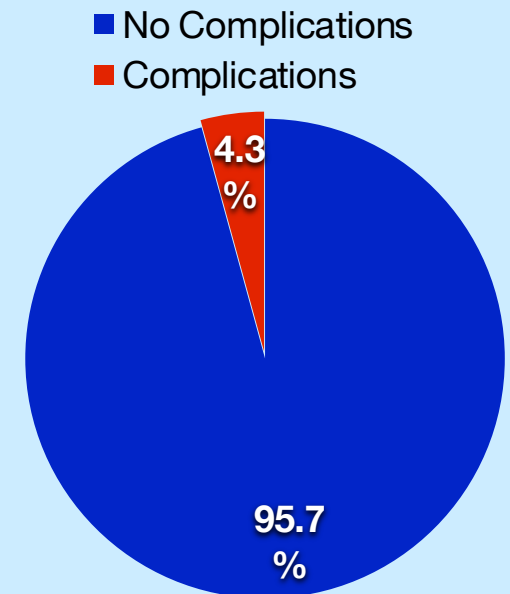


Figure 3. Wound complication rate.

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Results

- Smoking, diabetes, steroids or disease modifying anti-rheumatic drugs (DMARDs) use, open fracture and less than 14 days to surgery were not statistically associated with wound complications

Table 4. Assessment of dependent variables.

Variable	Fractures	Wound Complications	<i>p</i>
Smoking	64	3	1
Diabetes	14	1	0.47
Steroids/DMARDs*	6	0	1
Open Fractures	8	1	0.3
<14 days to Surgery	119	5	1

* Disease Modifying Anti-Rheumatic Drugs

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Conclusion

- Our study found an overall wound complication rate of 4.3% with only 0.6% requiring operative intervention.
- No associations were found between wound complications and smoking, diabetes, steroids/DMARDs use, open fracture and less than 14 days to surgery.
- The STA is an appropriate intervention by experienced surgeons for patients with calcaneus fractures who have these risk factors.



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Limitations

- Retrospective by design
- No alternative surgical group
- Did not have a large number of patients with risk factors
- Single fellowship, trained surgeon performed all cases

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Questions?