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Statement of Purpose

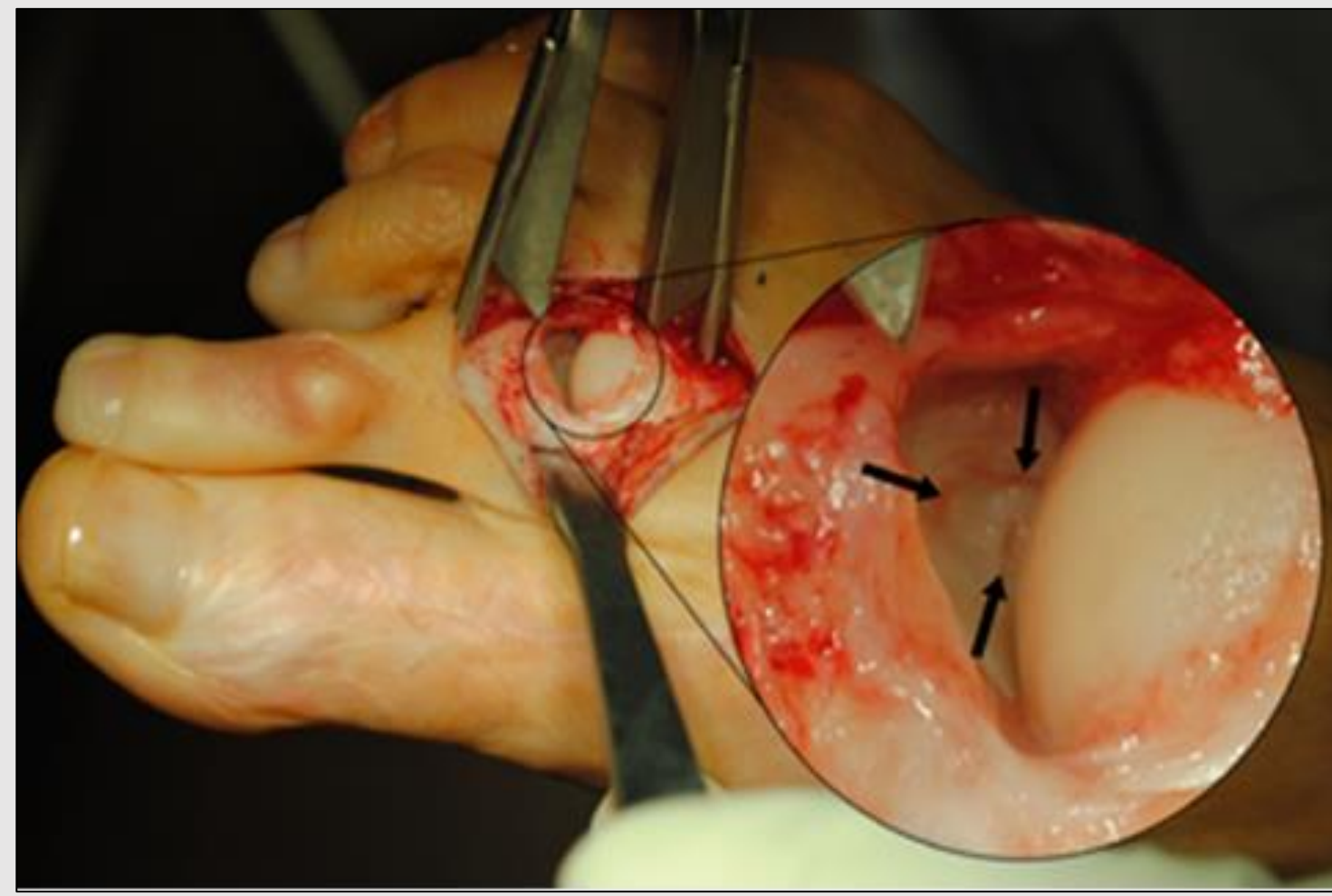
Plantar plate tears are a common cause of forefoot pain and digital deformity. Repair of the plantar plate has been described from both a dorsal and plantar approach, each with their own benefits and drawbacks. We present a novel and inexpensive method of direct plantar plate repair through a dorsal approach.

Methods

- We identified 21 patients treated with novel plantar plate repair by senior author between August 2012-October 2017. 9 total joints were included in our study.
- Patients had at least 1 year follow up.
- Excluded revision cases, flexor tendon transfers, collagen disorders and neuropathy.
- Clinical position and patient satisfaction of involved joints were evaluated.


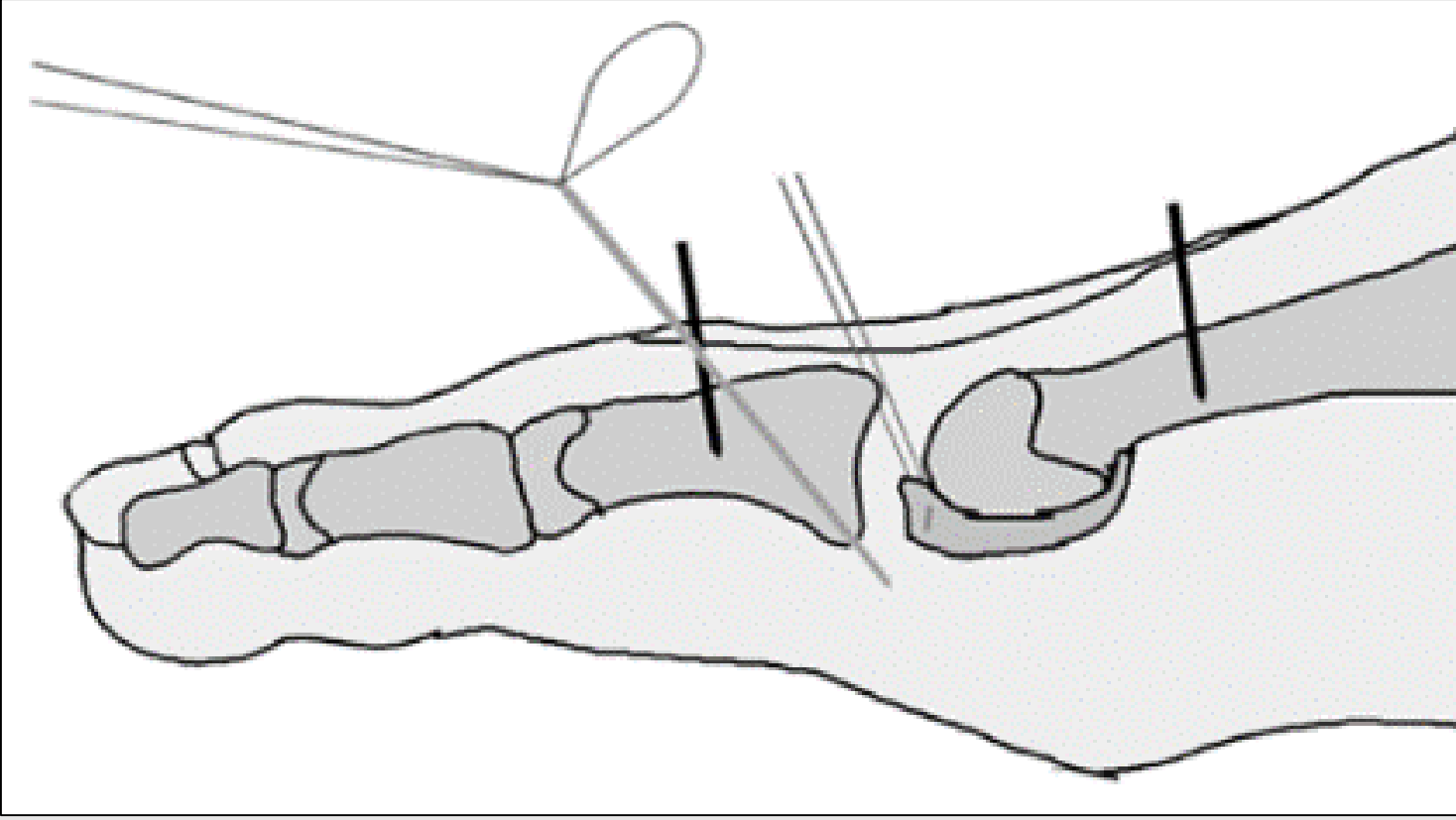
1 Dissection and Drill Holes

- Dorsal incision and dissection of the MPJ. Release remaining plantar plate from proximal phalanx
- Make parallel drill holes from dorsal to plantar in proximal phalanx with 0.062 K wire



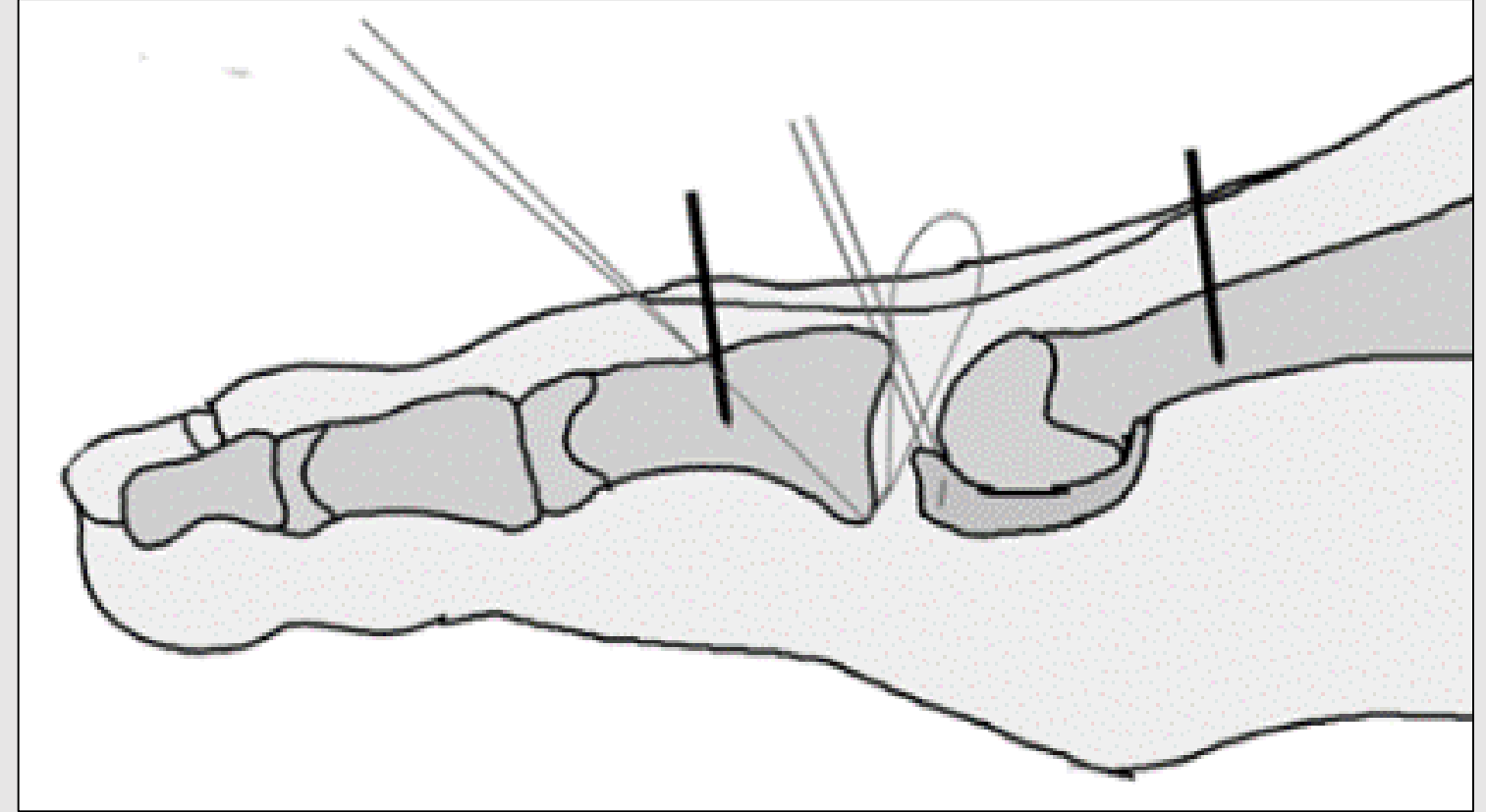
3 Vicryl Loop through Drill Hole

- A 4-0 Vicryl loop is passed through eyelet of a Keith needle
- Keith needle with Vicryl is passed through one of the drill holes in proximal phalanx

5 Retrieve Vicryl Loop from Joint

- Remove the Keith needle
- Retrieve the Vicryl loop from inside the joint



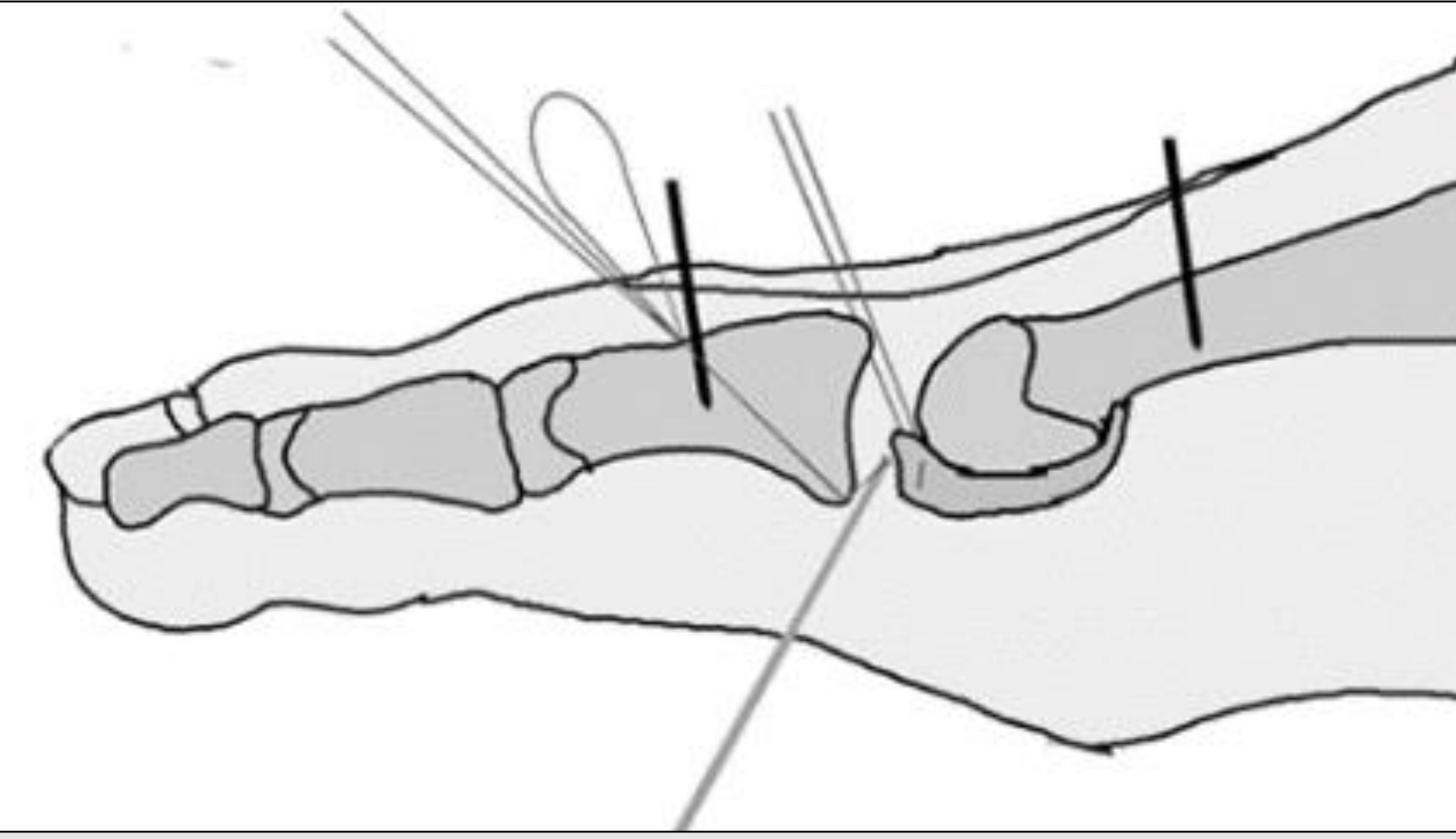
2 Passing Ethibond Suture into Plantar Plate

- Angiocatheter needle used to puncture plantar plate.
- Ethibond suture passed on Keith needle through lumen of angiocatheter into the plantar skin
- Redirect Ethibond to re-capture plantar plate prior to pulling angiocatheter and Keith needle out of the joint



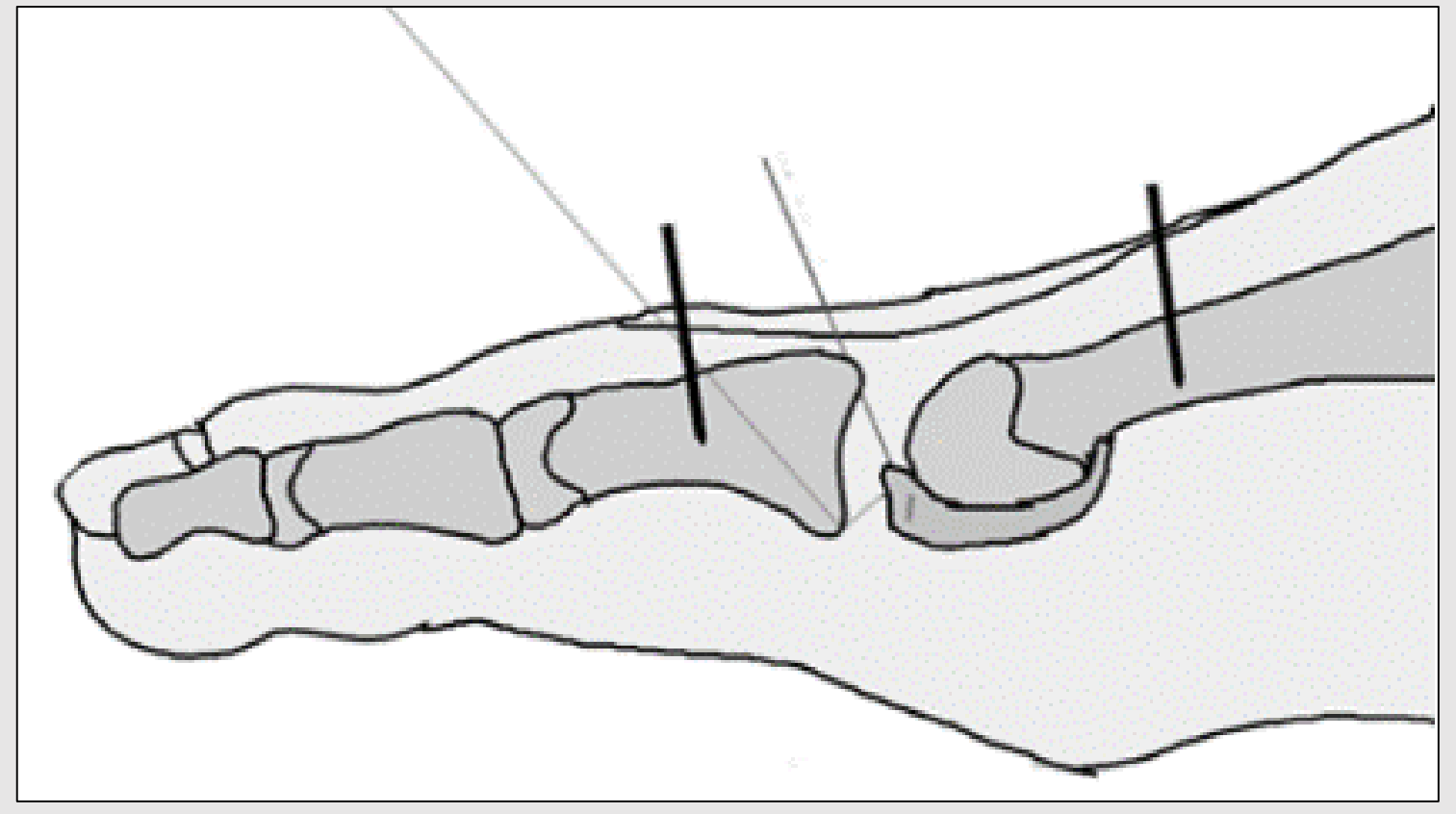
4 Pass Vicryl Loop into Joint

- Pass the Keith needle through the joint and out the plantar skin until the eyelet and Vicryl loop clear the base of the proximal phalanx
- You may need to re-puncture the joint capsule with the dull side of the needle to visualize the eyelet in the joint



6 Ethibond into Phalanx Using Vicryl Loop

- Use the Vicryl loop as a suture passer to pass the medial or lateral Ethibond strand out of the corresponding drill hole of the proximal phalanx
- Repeat steps 3-6 to pass the other strand of Ethibond through the other proximal phalanx drill hole
- Tie the Ethibond dorsally with the toe held in an over corrected position



Results

Average visual analog scale at final follow up was 0.78 ± 1.99 (range 0-6).

Three (33%) of the digits touched the ground with weight bearing. Average distance from the plantar skin of the digit to the ground was 2.56 ± 2.35 millimeters. Six (67%) toes were able to purchase the ground during paper strip pullout test. Eight of nine (89%) rays demonstrated negative Lachman's test at final follow-up. Five of the 6 (83%) patients stated they would have the procedure again.

Of the nine joints treated, the patients were very satisfied or satisfied with the results in 7 joints (77%) and dissatisfied in 2 joints (22%). None of the rays treated yielded very dissatisfactory results.

Conclusions

We were able to obtain satisfactory outcomes, with good alignment by repairing the plantar plate with this novel method. As compared to other studies, our study had similar or lower rates of post operative pain on the VAS score (1,2,3,4) Our data suggest that the described method of plantar plate repair can be used as an effective and inexpensive way to treat metatarsal phalangeal joint instability.

References

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4. Weil L, Sung W, Weil LS. Anatomic plantar plate repair using the Weil metatarsal osteotomy approach. *Foot and Ankle Specialists* 4: 145-150. 2011.