APOA Foot & Ankle Council Presents..

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

Presented by:

Dr. Yudha Manggala

Orthopaedic and Traumatology Surgery, Faculty of Medicine Soegijapranata Catholic University, Semarang, Indonesia

Title:

Surgical Treatment of Syndesmotic Injury Using Bioabsorbable Screw Fixation

Learning Points:

- Each syndesmotic fixation technique exhibits a unique set of advantages and drawbacks (Hovis et al., 2002). Metal screw fixation has been the standard method of treatment for syndesmotic ankle fractures for quite a while, despite occasional complications with infection or screw failures (Lee et al., 2021; van der Eng et al., 2015). However, it is currently accepted that there are clear disadvantages to the metal screw fixation method (Lee et al., 2021; van der Eng et al., 2015).
- The bioabsorbable screw is another method of syndesmotic fixation which has become increasingly prevalent. Apart from having biodegradable property, these polymeric based screws have been designed to deliver the specific bioactive molecules for improving osteoconductivity and viability as they augment the therapeutic potential of biomaterials (Ahmad et al., 2009; Kang et al., 2003; Ramos et al., 2020). Modulus of stiffness is similar to bone and allows gradual transfer of loading during resorbtion. There are few comparison studies with the bioabsorbable screw, but the available literature demonstrates promising clinical results (Cox et al., 2005; Noh et al., 2012). Many advantages of the bioabsorbable screw are the avoidance of screw removal, minimize interference with MRI and transfer load gradually that reduces stress shielding (Liu et al., 2021; Xie et al., 2015).

Upcoming Case of the Month
*April **2024***

Presented by:

Prof. Juan Agustin D. Coruña IV
MD FPOA FPOFAS FPCS,
Bacolod, Philippines

Title:

WALANT Technique on Achilles Lengthening in Charcot-Marie-Tooth Disease

Want to present a case? Write to...

Prof. Chayanin Anthong
chatthara@yahoo.com

Dr Kwai Ming Siu
siukmhk@hotmail.com

To become a member of APOA foot & ankle council CLICK HERE

APOA Foot & Ankle Council Presents..

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

Surgical Treatment of Syndesmotic Injury Using Bioabsorbable Screw Fixation

Dr. Yudha Manggala
Orthopaedic and Traumatology Surgery, Faculty of Medicine Soegijapranata Catholic University, Semarang, Indonesia
Email: yudhamanggala@ymail.com

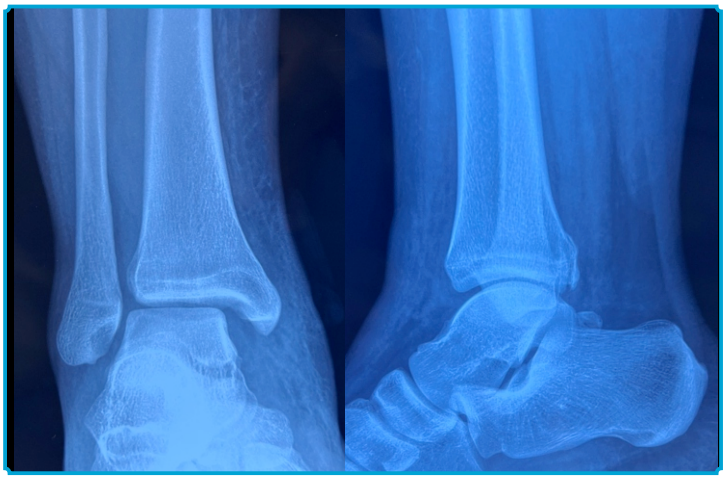
Case

Clinical presentation

A 24-year-old male patient suffered a right ankle fracture with syndesmotic injury a week ago. He complained about pain and restriction of dorsiflexion movement of his right ankle. The patient was otherwise fit and well with no other significant past medical history.

Clinical evaluation

Clinical examination showed a mild swelling on his right ankle with no open wounds. He had tenderness to palpation over his right ankle, pain over the anterior syndesmotic and external rotation stress test positive. Limited dorsiflexion and pain aggravated when bear the weight. No other discomfort or past medical history was reported. Squeeze test was positive. Neurovascular examination showed intact findings.



(Fig. 1)
Radiographic study of the Mortise / Lateral view of right ankle patient at the first-time visit

APOA Foot & Ankle Council Presents..

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

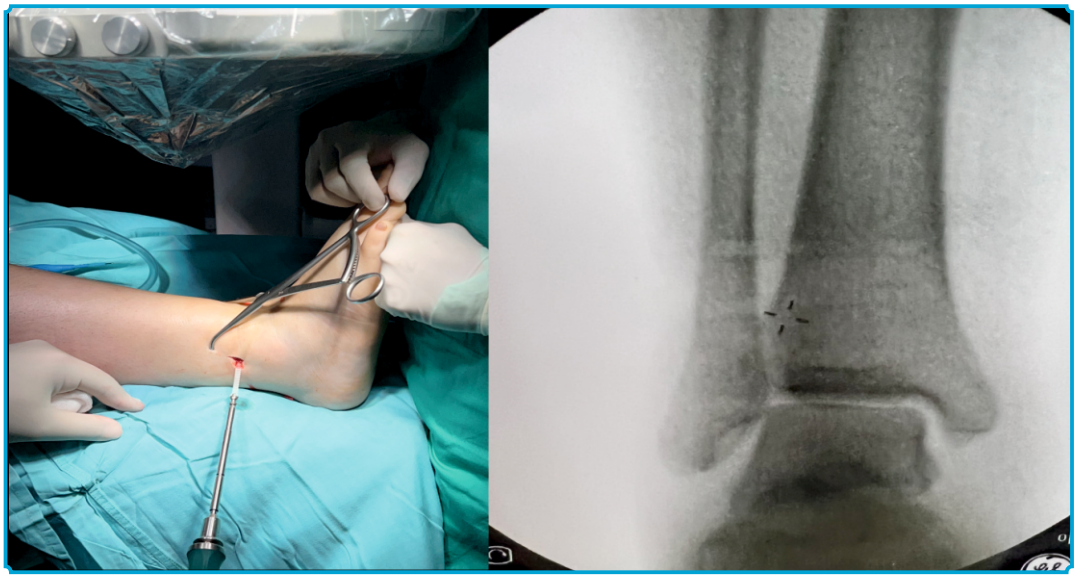
Radiologic evaluation

The mortise view of the right ankle showed there is no tibiofibular overlap, tibiofibular clear space widening 9 mm and medial clear space widening 7 mm, from the initial radiograph indicated his ankle fracture is described into supination-external rotation type. The lateral view showed fracture at posterior maleollus

The postoperative radiograph demonstrated that the patient underwent syndemotic fixation with double 4.5 mm bioabsorbable screw. It showed anatomic talar position with tibiofibular overlap 7 mm, tibiofibular clear space 4 mm and medial clear space 2 mm which indicated the syndesmotic injury has been reduced and realigned as appropriate.

(Fig. 2)

A bioabsorbable screw 4.5 mm fully threaded Inion FreedomScrewTM



(Fig. 3)

The reduction of the syndesmotic and appropriate placement of the positioning screws should be checked intra-operatively under fluoroscopy.

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

Treatment

Regarding his presentation, the author decided to perform the surgery to treat his ankle fracture with syndesmotic injury using bioabsorbable screw fixation. The method is to hold the fibula in the correct position in relation to the tibia. The syndesmotic is reduced, using reduction forceps with the ankle joint in dorsiflexion position. A double 4.5 mm fully threaded Inion FreedomScrewTM is placed through 3 cortices. The screws should be placed parallel to the tibial plafond, 2-3 cm proximal to the tibio-talar joint and 30 degrees from posterior to anterior. In the case of fibula fracture needed fixation this should be though the plate if feasible. The reduction of the syndesmotic and appropriate placement of the positioning screws should be checked intra-operatively with C-arm.

(Fig. 4)
The anteroposterior and lateral radiographs of right ankle at 3-month period after surgery.

Postoperatively, the patient remained non-weightbearing in a posterior splint for 8 weeks, wound check and removal of sutures at 2 weeks. He was allowed to bear the weight as pain as tolerated after 8 weeks and suggested to perform early rehabilitation. At 3 months following the surgery, he visited the author's clinic for the follow-up without any complains.

APOA Foot & Ankle Council Presents..

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

References

- Ahmad, J., Raikin, S. M., Pour, A. E., & Haytmanek, C. (2009). Bioabsorbable screw fixation of the syndesmosis in unstable ankle injuries. Foot & ankle international, 30(2), 99-105.
- Cox, S., Mukherjee, D. P., Ogden, A. L., Mayuex, R. H., Sadasivan, K. K., Albright, J. A., & Pietrzak, W. S. (2005). Distal tibiofibular syndesmosis fixation: a cadaveric, simulated fracture stabilization study comparing bioabsorbable and metallic single screw fixation. The Journal of Foot and Ankle Surgery, 44(2), 144-151.
- Hovis, W. D., Kaiser, B. W., Watson, J. T., & Bucholz, R. W. (2002). Treatment of syndesmotic disruptions of the ankle with bioabsorbable screw fixation. JBJS, 84(1), 26-31.
- Kang, J.-D., Kim, K.-R., Kim, H.-C., Lim, M.-S., Kim, J.-H., & Kim, S.-H. (2003). Treatment of syndesmotic injury of ankle with bioabsorbable screw. Journal of Korean Foot and Ankle Society, 7(1), 88-94.
- Lee, J. S., Curnutte, B., Pan, K., Liu, J., & Ebraheim, N. A. (2021). Biomechanical comparison of suture-button, bioabsorbable screw, and metal screw for ankle syndesmotic repair: a meta-analysis. Foot and Ankle Surgery, 27(2), 117-122.
- Liu, J., Pathak, G., Joshi, M., Andrews, K., & Lee, J. (2021). A meta-analysis comparing the outcomes of syndesmotic injury treated with metal screw, dynamic fixation, and bioabsorbable screw. Journal of orthopaedics, 25, 82-87.
- Noh, J. H., Roh, Y. H., Yang, B. G., Kim, S. W., Lee, J. S., & Oh, M. K. (2012). Outcomes of operative treatment of unstable ankle fractures: a comparison of metallic and biodegradable implants. JBJS, 94(22), e166.
- Ramos, D. M., Dhandapani, R., Subramanian, A., Sethuraman, S., & Kumbar, S. G. (2020). Clinical complications of biodegradable screws for ligament injuries. Materials Science and Engineering: C, 109, 110423.
- van der Eng, D. M., Schep, N. W., & Schepers, T. (2015). Bioabsorbable versus metallic screw fixation for tibiofibular syndesmotic ruptures: a meta-analysis. The Journal of Foot and Ankle Surgery, 54(4), 657-662.
- Xie, Y., Cai, L., Deng, Z., Ran, B., & Hu, C. (2015). Absorbable screws versus metallic screws for distal tibiofibular syndesmosis injuries: a meta-analysis. The Journal of Foot and Ankle Surgery, 54(4), 663-670.

APOA Foot & Ankle Council Presents..

Case of the Month

April 2024

www.apoaonline.com www.apoafootandankle.org

Case of the Month Sponsored by:

stryker

To become a member of APOA foot & ankle council CLICK HERE