THE AUSTRALIAN ANKLE SYNDESMOSIS INJURY SURVEY

Dr. Sam Hookway[1], Dr. Anton Lambers[1], Mr. Harvinder Bedi[4], Prof. Richard Page[1-3]

1. Barwon Health, Geelong, Australia
2. St John of God Hospital, Geelong, Australia
3. Barwon Centre for Orthopaedic Research and Education, Geelong, Australia
4. OrthoSport Victoria, Melbourne, Australia

INTRODUCTION

The ankle syndesmosis, a construct of four ligaments and interosseous membrane at the distal tibiofibular joint, provides stabilisation and forms a mortise for articulation of the talus and tibia (1, 2). It is estimated that 13% of all ankle fractures are associated with a syndesmosis injury (3). While conventional surgical stabilisation of the ankle syndesmosis has been achieved with syndesmotic screws, alternative methods include the use of dynamic stabilisation systems with suture-button devices. Suture-buttons employ a non-absorbable braided composite suture that is anchored with a cortical metal button, providing stability while potentially improving range of movement (4). Recent randomised controlled trials (5-8) studies have failed to elicit a common and conclusive recommendation when comparing static and dynamic stabilisation methods.

The primary aim of this study was to assess current practice variation in Australia, and enable a comparison with reported practice around the world. The secondary aims were to assess practice variation between operative indications, and inconsistencies between surgeon device usage and personal preference should they be injured themselves.

METHODS

A 20-item survey was created and distributed using REDCap. Questions were broadly divided into 3 subsections: surgical background, diagnosis/management and case studies. With Australian Orthopaedic Association (AOA) endorsement, the survey was advertised on the AOA website and monthly newsletter. The survey was also distributed to members of the Australian Orthopaedic Foot and Ankle Society (AOFAS) and the Australian Orthopaedic Trauma Society (AOTS) via email. Statistical analysis was performed utilising GraphPad Prism version 9. Contingency table analysis was conducted using Fisher's exact test, with a two-sided p value of < 0.05 regarded as statistically significant.

RESULTS

125 responses were received during the three-month study period. The highest response rate was from self-identified Lower Limb surgeons (28%), followed by Foot & Ankle surgeons (19.2%). Figure 1 illustrates surgeons' preference for diagnosis of isolated injuries without fracture, with a preference for MRI or weightbearing plain radiographs.

The most common method used to stabilise a syndesmotic injury by Australian orthopaedic surgeons is two 3.5mm screws (26.4%), closely followed by one suture-button (23.2%). The overall rate of suture-button use (one or more suture-buttons) is 44%. Self-identified Foot & Ankle surgeons are statistically more likely to use suture-buttons when compared to their colleagues ($p = 0.037$). Lower limb surgeons are more likely to use screws ($p = 0.043$) (Figure 2). Years of operative experience (<5 vs. >10) and number of injuries managed per year (<10 vs. >30) did not influence surgical preference for screw or suture-button ($p = 0.289$ and 0.282, respectively).

Younger patients with higher functional demands are more likely to be managed with a suture-button when compared to a sedentary 60-year-old (Figure 3). Additionally, if the fracture pattern shifted from a low to a high Weber C, patients are more likely to be managed with two constructs (two screws or two suture-buttons), regardless of age. Finally, when asked their preference in management of their own low Weber C fracture requiring plate and syndesmosis stabilisation, 60% percent of respondents would prefer to have a suture-button over a screw.

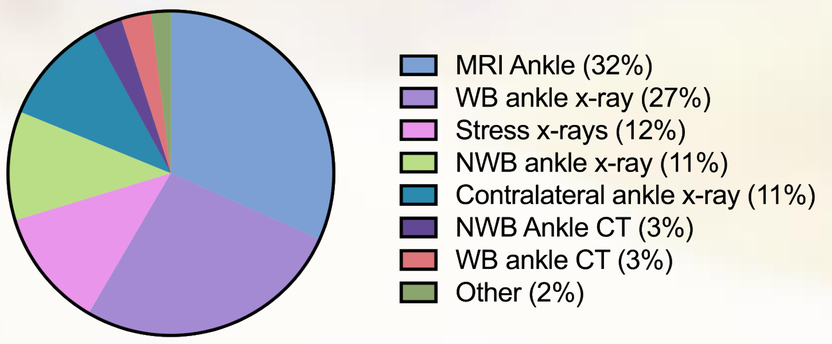

FIGURE 1. Preoperative diagnosis of syndesmosis injury (without fracture).

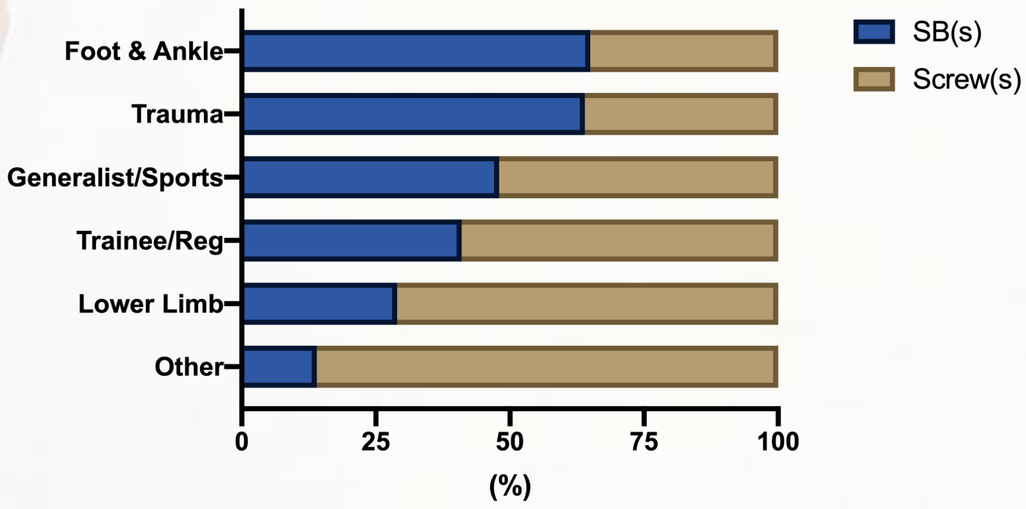

FIGURE 2. Preference for Screw vs Suture-button (SB) based on self-identified subspecialty.

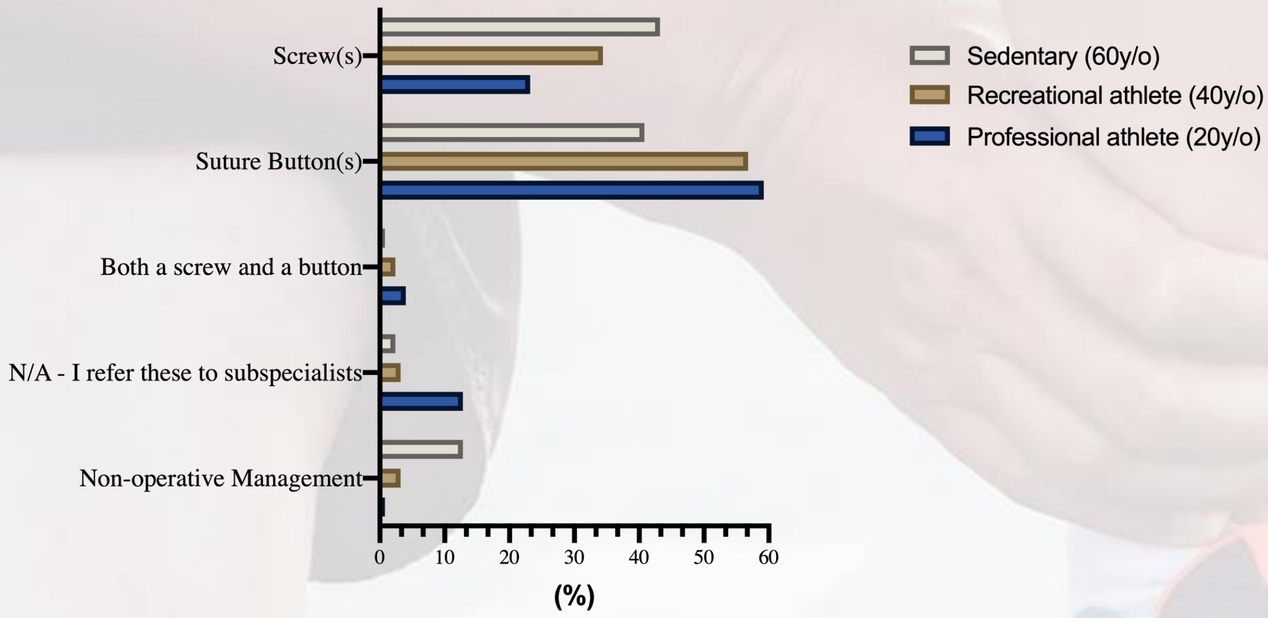

FIGURE 3. Surgeon preference for management of syndesmosis injury based on patient functional activity level.

'… 33% of surgeons who most commonly use screws would prefer a suture-button for their own ankle…'

DISCUSSION

44% of Australian surgeons most commonly use one or more suture-button devices. This is well above the reported rate in previous surveys of American (9, 10) and British (11) surgeons, at approximately 17% and 1.6% respectively. Our results suggest that Foot & Ankle surgeons are more likely to use a suture-button device. This may reflect their patient population and familiarity with these devices, as 12.8% of survey respondents stated they would refer a 20-year-old professional athlete to a subspecialist. Our results suggest that approximately half of surgeons recommend routine screw removal. There is no strong evidence in favour of screw removal (12) and it has been proposed that if screw removal rates exceed 17.5% then suture-buttons may be a more cost effective management strategy (13).

The series of case studies in our survey highlights the role of patient age, fracture pattern and functional status on surgeon preference for management options. Younger patients with higher functional demands are more likely to be managed with a suture-button device, presumably to achieve earlier postoperative weight bearing status and improved range of motion.

One of the aims of our study was to explore whether surgeons themselves would request the same treatments they prescribe. Interestingly, 33% of Australian surgeons who most commonly use screws would, in fact, prefer a suture-button for their own ankle. Perhaps this shows that Australian surgeons consider their functional activity level to be higher than the average patient they treat. It may also reflect the contribution of systemic issues, such as hospital policy and financial concerns. Finally, surgeons may have an unconscious bias in favour of suture-buttons which is not reflected in their own clinical practice.

CONCLUSION

Our study has captured the current state of practice within Australia with regard to the diagnosis and management of ankle syndesmosis injuries. Overall, significant variability in practice exists, consistent with the findings of previous international studies. Despite this, the rate of suture-button use does appear to be increasing and, given the potential benefits, may continue to do so.

REFERENCES

1. Tourné Y, Molinier F, Andrieu M, et al. Diagnosis and treatment of tibiofibular syndesmosis lesions. Orthop Traumatol Surg Res. 2019;105(8):275–86.
2. Lampridis V, Gougoulias N, Sakellariou A. Stability in ankle fractures: Diagnosis and treatment. EFORT Open Rev. 2018;3(5):294–303.
3. Dattani R, Patnaik S, Kantak A, et al. Injuries to the tibiofibular syndesmosis. J Bone Joint Surg Br. 2008;90-B(4):405–10.
4. Bondi M, Rossi N, Pizzoli A, et al. The use of TightRope fixation for ankle syndesmosis injuries: our experience. Musculoskelet Surg. 2016;100(3):217–22.
5. Onggo JR, Nambiar M, Phan K, et al. Suture button versus syndesmosis screw constructs for acute ankle diastasis injuries: A meta-analysis and systematic review of randomised controlled trials. Foot Ankle Surg. 2020;26(1):54–60.
6. Inge SY, Pull ter Gunne AF, Aarts CAM, et al. A systematic review on dynamic versus static distal tibiofibular fixation. Injury. 2016;47(12):2627–34.
7. Shimozono Y, Hurley ET, Myerson CL, et al. Suture Button Versus Syndesmotic Screw for Syndesmosis Injuries: A Meta-analysis of Randomized Controlled Trials. Am J Sports Med. 2019;47(11):2764–71.
8. McKenzie AC, Hesselholt KE, Larsen MS, et al. A Systematic Review and Meta-Analysis on Treatment of Ankle Fractures With Syndesmotic Rupture: Suture-Button Fixation Versus Cortical Screw Fixation. J Foot Ankle Surg. 2019;58(5):946–5.
9. Bava E, Charlton T, Thordarson D. Ankle Fracture Syndesmosis Fixation and Management: The Current Practice of Orthopedic Surgeons. Am J Orthop. 2010;39(5):242–6.
10. Coles CP, Tornetta P, Obremskey WT, et al. Ankle Fractures: An Expert Survey of Orthopaedic Trauma Association Members and Evidence-Based Treatment Recommendations. J Orthop Trauma. 2019;33(9):e318–24.
11. Monga P, Kumar A, Simons A, et al. Management of distal tibio-fibular syndesmotic injuries: A snapshot of current practice. Acta Orthop Belg. 2008;74:365-9.
12. Dingemans SA, Rammelt S, White TO, et al. Should syndesmotic screws be removed after surgical fixation of unstable ankle fractures? a systematic review. Bone Jt J. 2016;98-B(11):1497–504.
13. Ramsey DC, Friess DM. Cost-Effectiveness Analysis of Syndesmotic Screw Versus Suture Button Fixation in Tibiofibular Syndesmotic Injuries. J Orthop Trauma. 2018;32(6):e198–203.