Chapter 5

Comment on “Complications in ankle arthroscopy”: Anatomy, an important factor to avoid complications related to ankle arthroscopy

Pau Golanó
Jordi Vega

and

Response to: comment on “complications in ankle arthroscopy”: Anatomy, an important factor to avoid complications related to ankle arthroscopy

Maartje Zengerink
C. Niek van Dijk

Chapter 5

Dear Editor,

We read with interest the recent article by Zengerink and Van Dijk [6] in *Knee Surgery, Sports Traumatology and Arthroscopy* and would like to express our comments to the authors on their study. The detailed description of their approach and the advice provided to reduce complications related to ankle arthroscopy is of great value. The authors reported an overall complication rate of 3.5%, which is less than half that reported previously in the literature. They mention: ‘one should always aim for the lowest possible number of complications and the use of a meticulous technique can aid in reaching this goal’. We completely agree on that point; the use of a carefully planned and executed technique greatly contributes to avoiding procedure-related complications. However, we would suggest that there is another important factor involved, which may not have been sufficiently highlighted in this superb study: the anatomy of the joint.

The authors mention some anatomical details [2, 3] that support the philosophy of their arthroscopic protocol. However, the word anatomy is only mentioned once: ‘Although the anatomy of the ankle is rather complex, ankle arthroscopy is generally perceived as “no problem surgery”’. Nonetheless, a thorough knowledge of the extra- and intra-articular anatomy is extremely important in ankle arthroscopy, as it is in arthroscopy of other joints. The extra-articular anatomy may be particularly crucial in the ankle, since many vital structures surrounding the arthroscopic portals are susceptible to injury during the procedure [1, 4] (Fig. 1), especially nerves, as Zengerink and Van Dijk mentioned [6]. The authors reported 1.9% of neurological complications, most of which were related to placement of the arthroscopy portals.

Identification of anatomical landmarks is essential for proper positioning of the portals and facilitating orientation during the procedure. An awareness of and familiarity with these points of reference is of particular value to less experienced surgeons. Regrettably, a description of the anatomical landmarks, a crucial aspect, was missing in the report of Zengerink and Van Dijk’s ankle arthroscopy technique [6].

The anatomical landmarks surrounding the ankle joint, which include bones, tendons and neurovascular structures, should be delimited on the patient’s skin with a dermographic marker before the procedure. Adequate knowledge of the location of these structures is essential to avoid confusion and serious technical errors and should include not only the most common anatomical configurations in statistical terms, but also possible anatomical variations [5]. Fortunately, the development of ankle arthroscopy has been preceded by an improvement in our anatomical knowledge of this joint, enabling the indications for the procedure to be better defined and making the technique safer. Zengerink and Van Dijk have shown that the use of a meticulous technique with the approach they described lowers the rate of complications associated with ankle arthroscopy [6]. Undoubtedly, scrupulous attention to the extra-articular and intra-articular anatomy of the ankle joint is a necessary factor to achieving such favourable results.

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![Figure 1: Transverse section at the level of the tibiofibular syndesmosis showing important structures susceptible to injury during ankle arthroscopy.](image-url)

1. Lateral malleolus; 2. tibia; 3. anterior neurovascular bundle (deep peroneal nerve and anterior tibial artery and veins); 4. intermediate dorsal cutaneous nerve (lateral branch of the superficial peroneal nerve); 5. medial dorsal cutaneous nerve (medial branch of the superficial peroneal nerve); 6. posterior neurovascular bundle (posterior tibial nerve and posterior tibial artery and veins); 7. sural nerve and small saphenous vein; 8. saphenous nerve and great saphenous vein; 9. anterior peroneal artery; 10. posterior peroneal artery; 11. tibialis anterior tendon; 12. extensor hallucis longus tendon; 13. extensor digitorum longus tendon; 14. peroneus tertius tendon; 15. peroneus brevis tendon; 16. peroneus longus tendon; 17. tibialis posterior tendon; 18. flexor digitorum longus tendon; 19. flexor hallucis tendon (musculotendinous); 20. calcaneal and plantaris tendon.
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**Figure 1** Transverse section at the level of the tibiofibular syndesmosis showing important structures susceptible to injury during ankle arthroscopy. 1 Lateral malleolus; 2 tibia; 3 anterior neurovascular bundle (deep peroneal nerve and anterior tibial artery and veins); 4 intermediate dorsal cutaneous nerve (lateral branch of the superficial peroneal nerve); 5 medial dorsal cutaneous nerve (medial branch of the superficial peroneal nerve); 6 posterior neurovascular bundle (posterior tibial nerve and posterior tibial artery and veins); 7 sural nerve and small saphenous vein; 8 saphenous nerve and great saphenous vein; 9 anterior peroneal artery; 10 posterior peroneal artery; 11 tibialis anterior tendon; 12 extensor hallucis longus tendon; 13 extensor digitorum longus tendon; 14 peroneus tertius tendon; 15 peroneus brevis tendon; 16 peroneus longus tendon; 17 tibialis posterior tendon; 18 flexor digitorum longus tendon; 19 flexor hallucis tendon (musculotendinous); 20 calcaneal and plantaris tendon
To the editor:

We would like to thank Dr. Golanó for his valuable comment on our article concerning complications in ankle arthroscopy. In our study, we found a significantly lower number of complications than was known in the literature [14]. In our article, we focus on description of the number and type of complications that occurred in our hospital, and we describe in summary the protocolized surgical technique leading to this lower number of complications. This technique on one hand aims at lowering complications like sinus tract formation and infection, complications that are not anatomical in nature, and on the other hand at lowering neurovascular complications. Half of the complications that occur are of neurovascular origin. To avoid these, anatomical knowledge is critical.

Anatomy is always the basis of every surgical technique. It goes without saying we agree with Dr. Golanó that knowledge of intra- and extra-articular anatomy is mandatory in preventing complications in ankle arthroscopy. Since we focused on describing the occurring complications and the surgical steps of anterior and posterior ankle arthroscopy that can avoid them, we did not describe the underlying ankle anatomy in detail.

Arthroscopic ankle anatomy has been very well described and visually presented by Dr. Golanó and his team in the past [4, 5] and in the recently published work [3]. Furthermore, the various courses of the important neurovascular ankle structures have been described in various studies [6, 8, 12], many of them specifically in relation to ankle arthroscopy [1, 2, 7, 9-11, 13]. We highly recommend ankle arthroscopists to know and stay up to date of this extensive literature.

References

Complications and anatomy

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