

Endoscopic-Assisted Release of Exertional Leg Compartment Syndrome: A New Surgical Technique

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Purpose: Chronic exertional compartment syndrome can be a limiting cause of lower leg activity-related pain. The anterior compartment is the most commonly involved. Due to a poor success rate with nonoperative management, surgical management with fascial release is the gold standard. Over the years, minimally invasive approaches with smaller incisions have gained popularity over the traditional technique of an open fasciotomy along the entire length of the leg. Mini-invasive techniques for surgical decompression have been described; however, with the risk of incomplete fascial release or injury to neurovascular structures. This led to the evolution of endoscopically assisted techniques. However, endoscopic compartment release has been described as a time-consuming and technically demanding procedure.

Methods: After analyzing the literature and the in vivo endoscopic techniques published so far, we propose a technique utilizing the EndoBlade™ System (Arthrex), originally designed for endoscopic gastrocnemius recession.

Results: We describe a technique using two 1-cm incisions that allows visualization of the entire length of the anterior and lateral compartments. The patient is positioned in a supine position and with a tourniquet on the thigh. The first longitudinal incision is performed at the junction between the anterior and lateral compartments. The trocar is then utilized to prepare the subcutaneous path, and the cannula and trocar are inserted in the subcutaneous space lying over the fascia. At the tip of the trocar, we make a longitudinal incision along the same line indicated previously. The 30° arthroscope is then introduced into the cannula, and the fascia is observed. From the counter-incision, the hook knife is introduced. Dorsiflexion of the foot will help maintain tension during the procedure. The hook knife is then gradually retracted while gently pressing it against the fascia. Under careful visualization, the fascia is cut, releasing the muscle belly. After completion, the cannula is introduced from the counter-incision, and the remaining part of the fascia is released by the hook knife introduced. The underlying muscle is observed along the entire length to confirm the complete release.

Conclusion: We believe that this method offers a technique that is quick and easy to perform compared to other endoscopic procedures, safe compared to other minimally invasive techniques, and with a rapid recovery compared to the traditional open approach.