

The Extended Knee Hemilithotomy Position for Gastrocnemius Recession

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ABSTRACT

The focus of this communication is to share an alternative positioning method that we have used over the past 3 years for gastrocnemius recession with the patient supine on the operating table. The technique uses a candy-cane leg holding system to situate the patient in the extended knee hemilithotomy position. We have found that this position provides excellent visualization of the surgical site, furnishes the anesthesiologist with optimal access to the patient, negates the need to turn the patient from prone to supine when adjunct procedures are to be undertaken, and allows the involved extremity to remain sterile throughout the operation, without an increase in complications or cost.

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The gastrocnemius recession is a procedure that is commonly performed by foot and ankle surgeons, either in isolation or in combination with other surgical maneuvers. When performing a gastrocnemius recession, as with any procedure, the surgeon must decide the best way to position the patient on the operating room (OR) table. The surgeon must take into consideration the individual patient's needs, their respective comorbidities, access to and visualization of the surgical site, whether the procedure will be performed in isolation or in combination with other interventions, as well as the method of anesthesia.

To our knowledge, the 2 most common positions used for gastrocnemius recession are the prone and supine "frog-leg" positions. In the authors' experience, both of these positions convey substantial drawbacks. Although it provides optimal access to the target structures, the prone position can be very challenging to the anesthesiologist and may require that the patient be turned for additional procedures, which may necessitate prepping and draping the extremity a second time and adds time to the overall duration of the operation. The supine "frog-leg" position compromises the surgeon's visualization of the surgical site, especially when a midline incision is used. For this reason, many surgeons use a medial approach to gastrocnemius recession when the supine "frog-leg" position is used. Over the last 3 years, we have come to appreciate the advantages of a variation of supine positioning for gastrocnemius recession,

one in which the patient's involved lower extremity is extended at the knee with the foot suspended from a candy-cane stirrup.

Surgical Technique

The patient is initially placed on the OR table in the supine position. After the desired level of anesthesia is achieved and, if desired, a thigh tourniquet applied, a candy-cane bracket is affixed to the outer rail of the middle of the table, just proximal to the knee (Figure 1). The candy-cane stirrup extension is then secured in the bracket and positioned so that the leg will be near vertical once the strap is applied to the foot (Figure 2). It is better to err by having the candy-cane stirrup placed too far proximal, as long as the ipsilateral hip and knee are not excessively flexed and extended, respectively. The foot and leg are then scrubbed in the usual aseptic manner, after which a sterile stockinette is placed about the patient's foot and leg, and a sterile member of the surgical team holds the extremity in an elevated position. Meanwhile, a sterile Mayo stand cover is placed over the candy-cane extension (Figure 3), and the foot and leg are draped in the usual fashion. Then, the surgeon pinches the Mayo stand cover to find the ring at the end of the candy cane (Figure 4). Once the ring is isolated, a foot strap, which is the same strap that is used with the ankle distracter, is clipped to it. Tegaderm (3 M Company, St. Paul, MN) transparent dressing material is then used to cover the clip and ring to maintain sterility. Finally, using sterile gloves, the foot is placed in the strap and suspended from the candy-cane stirrup (Figure 5). In this position, the posterior aspect of the leg is readily visualized, and, gastrocnemius recession, or other procedures localized to the Achilles tendon and gastrocnemius aponeurosis, can be carried out with the patient supine (Figure 6). In essence, this position is a variation of the

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Fig. 1. Positioning the mounting bracket for the candy-cane stirrup, just proximal to the ipsilateral knee.

hemilithotomy position, although the ipsilateral hip is not significantly abducted or externally rotated, and the knee is extended (1). Moreover, in this position, the foot is fully accessible and can be manipulated into dorsiflexion and plantarflexion to facilitate the recession.

Discussion

The surgical position proposed by the authors provides an alternative approach to gastrocnemius recession, without adding extra time or cost to the operation. It also allows the patient to remain supine on the OR table, which is usually preferred by the anesthesiologist and tends to be easier on the OR staff. This setup provides excellent visualization of the posterior surface of the leg and allows the gastrocnemius recession to be performed in combination with other procedures without having to turn the patient from prone to supine during the surgery. The leg can also be placed into, or removed from, the candy-cane stirrup whenever



Fig. 3. Draping the candy-cane leg holder with a Mayo stand cover while the foot is held with a sterile stockinette.

necessary because the surgical field remains sterile. Furthermore, a pneumatic thigh tourniquet can be applied and used at the discretion of the surgeon. In fact, a tourniquet need not be inflated to perform the gastrocnemius recession, because anatomical dissection in this area does not typically require exsanguination and complete hemostasis, and the extended knee hemilithotomy position elevates the leg and foot to such a degree that bleeding is minimized. We typically apply the tourniquet when additional procedures are to be undertaken after performance of the gastrocnemius recession, and the cuff can be inflated after the leg is removed from the candy-cane stirrup.

We think that it is also important to understand the prolonged procedures with the leg in the extended knee hemilithotomy position can theoretically lead to ischemia, compartment syndrome, deep venous thrombosis, and nerve and muscle compressions, all of which have been reported in association with surgeries performed with the patient in the lithotomy position and its variations (2–11). For this reason, we recommend that the knee-extended hemilithotomy

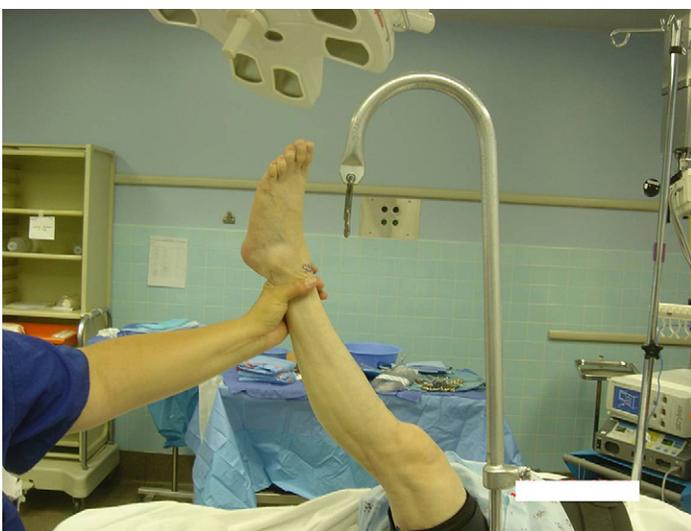


Fig. 2. Positioning the candy-cane stirrup so that when the foot is in the strap, the leg will be nearly vertical.



Fig. 4. Application of a sterile foot strap through the ring on the end of the candy-cane stirrup, which is draped with the Mayo stand cover.



Fig. 5. With the leg nearly vertical and the foot in the sterile strap, which is attached to the candy-cane stirrup, the posterior aspect of the leg is readily visualized and ready for surgical dissection.



Fig. 6. With the foot positioned in the candy-cane stirrup, the posterior aspect of the lower leg is easily accessed for the gastrocnemius recession.

position that we describe in this report be reserved for procedures that are shorter than 20 to 30 minutes in duration. Although we currently use this setup solely for gastrocnemius recessions, it can also be used for other procedures that require access to the posterior aspect of the leg, in appropriately selected patients and for operations expected to last less than 20 to 30 minutes.

References

1. Meyer RS, White KK, Smith JM, Groppo ER, Mubarak SJ, Hargens AR. Intramuscular and blood pressures in legs positioned in the hemilithotomy position. *J Bone Joint Surg (Am)* 84-A 10:1829–1835, 2002.
2. Weber O, Kabir K, Goost H, Wirtz DC, Burger C. The “well-leg” syndrome: calf compartment after lithotomy position. *Z Orthop Unfall* 146(2):261–263, 2008.
3. Kumamoto T, Hara S, Yoshitake A, Shimoda O, Terasaki H. Well leg compartment syndrome during prolonged surgery in the lithotomy position. *Masui* 56(6):695–698, 2007.
4. Beraldo S, Dodds SR. Lower limb acute compartment syndrome after colorectal surgery in prolonged lithotomy position. *Dis Colon Rectum* 49(11):1772–1780, 2006.
5. Wassenaar EB, Van Den Brand JG, Van Der Werken C. Compartment syndrome of the lower leg after surgery in the modified lithotomy position: report of seven cases. *Dis Colon Rectum* 49(9):1449–1453, 2006.
6. Mathews PV, Perry JJ, Murray PC. Compartment syndrome of the well leg as a result of the hemilithotomy position: a report of two cases and review of literature. *J Orthop Trauma* 15(8):580–583, 2001.
7. Chase J, Harford F, Pinzur MS, Zussman M. Intraoperative lower extremity compartment pressures in lithotomy-positioned patients. *Dis Colon Rectum* 43(5):678–680, 2000.
8. Anglen J, Banovetz J. Compartment syndrome in the well leg resulting from fracture-table positioning. *Clin Orthop Relat Res* 301:239–242, 1994.
9. Canterbury TD, Wheeler WE, Scott-Conner CE. Effects of the lithotomy position on arterial blood flow in the lower extremities. *W V Med J* 88(3):100–101, 1992.
10. Postaci A, Karabeyoglu I, Erdogan G, Turan O, Dikmen B. A case of neuropathy after caesarean section under spinal anesthesia. *Int J Obstet Anesth* 15(4):317–319, 2006.
11. Warner MA, Warner DO, Harper CM, Schroeder DR, Maxson PM. Lower extremity neuropathies associated with lithotomy positions. *Anesthesiology* 93(4):938–942, 2000.

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