Adductor canal and femoral triangle: Two different rooms with the same door

Sir,

The adductor canal block (ACB) is being increasingly used for postoperative analgesia in knee surgery since its first description.[1]

Several clinical trials have shown its analgesic efficacy along with preserved quadriceps strength and increased motor recovery compared with the femoral nerve block. The sensitive fibers in the adductor canal (AC) are represented by the saphenous nerve and the medial femoral cutaneous nerve, relevant for analgesia of the anteromedial surface of the knee.

The ACB was first described to be performed under ultrasound guidance at the mid-point between the anterosuperior iliac spine and the base of the patella, injecting a local anesthetic (LA) around the saphenous nerve, surrounded by the femoral vessels medially, the sartorius muscle (SM) superiorly, and the vastus medialis muscle laterally.

Although there is a general consensus regarding the efficacy of the ACB, debates have emerged in the recent years about how the block should be executed.[2]

The first concern regards the anatomy of the block: Cadaveric studies underlined how the AC begins at the apex of the femoral triangle (FT) or Scarpa's triangle, identified by the intersection between the medial border of the SM and adductor longus muscle (ALM).[3] From this point distally towards the adductor hiatus, the vastoadductor membrane (VAM) appears and the nerve to vastus medialis remains outside the canal. Therefore, an ACB is executed at the apex of the FT or more distally, while a block performed more proximally would anesthetize the nerve to vastus medialis as well as the saphenous nerve and should be called a femoral triangle block (FTB).[2]

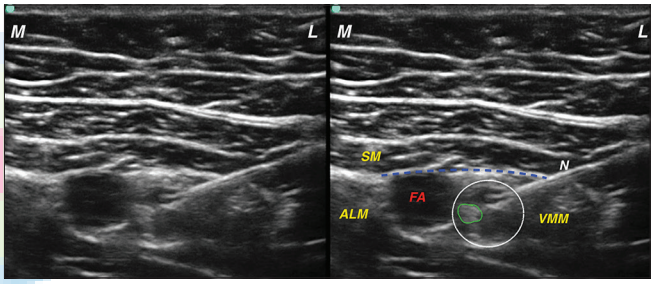

Figure 1: The soap bubble sign (blue dashed line: vastoadductor membrane; white circle line: the bubble filled with local anesthetic; green line: saphenous nerve). ALM: adductor longus muscle, L: lateral, M: medial, N: needle, SM: sartorius muscle, VMM: vastus medialis muscle. AC: adductor canal, AL: adductor longus muscle, ASIS: anterosuperior iliac spine, BP: base of patella, FA: femoral artery, FT: femoral triangle, SM: sartorius muscle

The second arisen concern is the LA spread. Two different patterns have been described: A subsartorial injection superficial to the VAM[4] and a periarterial injection inside the AC.[3] However, this appears to be only a technical difference in the block execution, as the describing authors do not expect to have different analgesic effects.[3,4]

Considering the lack in the literature about the block execution modalities (ACB vs FTB; subsartorial vs intracanal

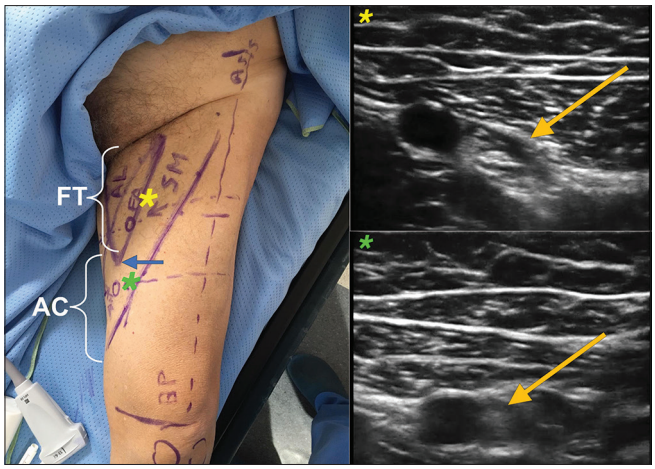

Figure 2: The soap bubble sign in the adductor canal and femoral triangle after injection of local anesthetic (yellow asterisk: probe location at FT and relative US image; green asterisk: probe location at AC and relative US image; blue arrow: local anesthetic injection site at the apex of the FT)

spread), clinicians could be confused about how to optimally perform the block. For this reason, maybe it is time to clarify and standardize the execution of ACB.

In our institutions, the block is performed at the apex of the FT, identified with ultrasound. The needle is entered from lateral to medial, piercing the SM and the VAM, and LA (10–15 mL ropivacaine 0.5%) is injected between the femoral artery and the saphenous nerve.

The injection of LA shapes into a hypoechoic sphere with a hyperechoic structure within represented by the saphenous nerve: this looks like a soap bubble, the "soap bubble sign" (SBS) [Figure 1].

Moving the probe along the femoral vessels, the SBS could be seen distally and proximally to the injection point up to the inguinal crease [Figure 2]. As described in cadaver studies, this confirms that the AC and the FT are connected.[5] Injection should be stopped as this target is achieved and a larger volume should be avoided as the LA spread could reach the proximal motor branches of the femoral nerve, resulting in quadriceps weakness.[6] Hence, a distinction between ACB and FTB as two separate block techniques may only be speculation as the AC and the FT are anatomically connected to each other.

In conclusion, a good spot to perform the ACB is close to the femoral artery at the apex of the FT obtaining the SBS.

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Conflicts of interest
There are no conflicts of interest.

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