Anatomy of the Lateral Femoral Cutaneous Nerve; a Cadaveric Study

Amgad Hanna, MD, FAANS, and Mark Ehlers

Department of Neurosurgery, University of Wisconsin, Madison

INTRODUCTION

The lateral femoral cutaneous nerve (LFCN) has a variable course. This represents an operative challenge when decompression is required. We conducted this study to define the variability of the nerve relationship to the anterior superior iliac spine (ASIS), and also the relationship to the fascial planes superficial and deep to the nerve.

METHODS

We dissected 8 fresh cadavers bilaterally except in 2 cases where only one limb was available (total 14 nerves). We identified the LFCN as it enters the thigh under the inguinal ligament, and measured the distance between this entry point and the ASIS. We also dissected the fascial plane between the nerve and the Sartorius muscle.

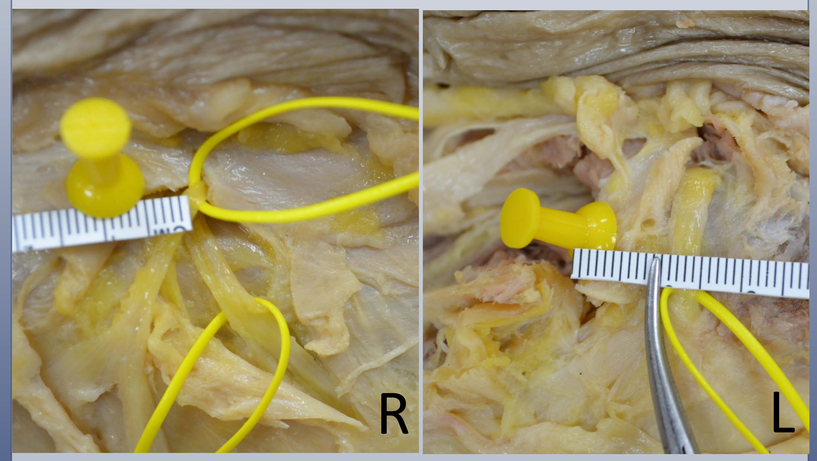
RESULTS

There was great variability in the course of the nerve and its relationship to the ASIS. This varied from 5.8 cm medial to 1.3 cm lateral to ASIS (table 1). There was right and left asymmetry in most cases (figure 1). This is consistent with previous literature findings. Traditionally the nerve has been described to run deep to the Sartorius fascia. Our findings indicate that the nerve runs in its individual tunnel (figure 2), with one fascial layer overlying the nerve and another one underlying the nerve.

Table 1. Distance in cm between the LFCN and the ASIS. In this series it varied from 5.8 cm medial to 1.3 cm lateral to the ASIS. There was no bilateral symmetry in most cases. R = right; L = left

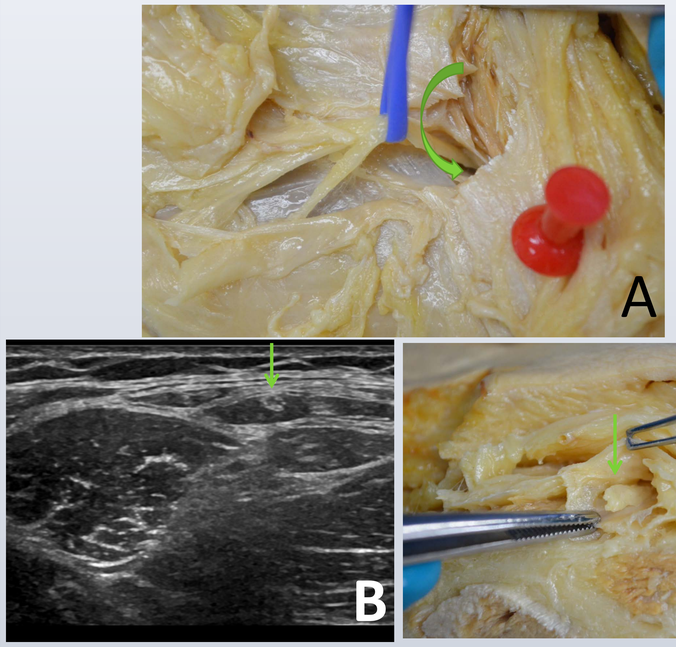
Specimen	R	L
1	1.3	1.3
2	3.5	**5.8**
3	0.9	**-1.3** (lateral to ASIS)
4	2.7	4.5
5	0.2	0.5
6	2.5	1.5
7	--	3.5
8	0.5	--

Figure 1. Specimen 3, right (R) and left (L) LFCN (in yellow loops) dissection. Note relationship to ASIS (yellow pin). In R, the nerve is 0.9 cm medial to ASIS, while in L, the nerve is 1.3 cm lateral to ASIS. Note bilateral asymmetry.



To our knowledge this individual tunnel was never described before.

Figure 2. A. The LFCN going through its individual tunnel (curved arrow) under the inguinal ligament, medial to the ASIS (red pin). B. Cross-section ultrasound view of the LFCN (green arrow) in its individual tunnel. C. Same view in a cadaver cross-section



CONCLUSION

The LFCN has a variable course and relation to the ASIS. It also has its individual tunnel as it enters the thigh. This was never described in the past. The combination of these 2 factors renders surgical localization of the nerve extremely difficult, and time-consuming. However, most symptomatic cases are because of proximity to the ASIS. Because of the fascia deep to the nerve, opening the Sartorius fascia away from the nerve may cause the operator to be in a plane deep to the nerve. This prompted us to develop methods for preoperative imaging and localization of the nerve.