

Electrophysiological Study of the Posterior Cutaneous Femoral Nerve: Normative Data

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Abstract

The posterior cutaneous femoral nerve provides cutaneous innervation of the posterior surface of the thigh and leg, as well as the skin of the perineum. Using Dumitru et al. [1] technique for the assessment of this nerve, we studied one hundred and sixteen limbs from fifty-eight healthy volunteers. The mean values for the posterior cutaneous femoral nerve were as follows: onset latency 2.0 msec (± 0.5), amplitude 7.0 μ V (± 2.1), nerve conduction velocity 52 m/s (± 4). The assessment of the posterior femoral cutaneous nerve is simple and reproducible. The results of this standardization were similar to the ones described in international literature.

Keywords: Femoral nerve; Posterior cutaneous nerve

Introduction

The posterior cutaneous nerve of the thigh leaves the pelvis through the sciatic foramen, below the piriformis muscle and passes down the buttock and thigh on the medial aspect of the sciatic nerve. It consists of nerve roots from the anterior and posterior divisions of S1, S2 and anterior divisions of S2, S3. The perineal branches provide sensory innervation to the superior medial surface of the thighs, the skin of the scrotum or labia majora. The gluteal branches, turn upward around the lower border of the gluteus maximus, and supply the skin covering the lower and lateral part of that muscle. The main part to the back of the thigh and leg consists of numerous filaments derived from both sides of the nerve, and distributed to the skin covering the back and medial side of the thigh, the popliteal fossa, and the upper part of the back of the leg. The collateral branches from the anterior divisions extend themselves to the quadratus femoris and inferior gemini muscles (L4,L5,S1) and to the internal obturator and superior Gemini muscles (L5,S1,S2) [1-4].

Isolated lesions of the nerve are rare, with only six cases described, and one case documented with the nerve conduction on a 25 year old woman with a lesion after intramuscular injection [5].

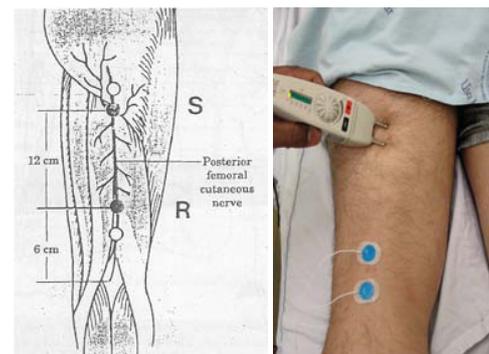
The aim of this study was to access the posterior cutaneous femoral nerve and compare our data with pre-existing international literature and propose standardization for the nerve.

Material and Methods

One hundred and sixteen limbs from fifty-eight healthy volunteers were evaluated using Dumitru et al. [1] technique (Figure 1). In this technique the recording site consists in placing the active surface electrode in the midline of the posterior thigh, 6 cm proximal to the midpopliteal region. The reference electrode is placed 3 cm distally. The stimulation site consists in placing the surface electrode 12 cm proximal to the recording electrode on a line connecting the active recording electrode with the ischial tuberosity in the groove between the medial and lateral hamstring muscles. This intermuscular groove is confirmed by palpating the posterior thigh while asking the patient to flex the knee slightly [6]. The latency was measured from the stimulus onset to the onset of the SNAP. The amplitude was measured from the negative peak to the baseline.

Results

The mean values for the posterior cutaneous femoral nerve were as follows: onset latency 2.0 msec (± 0.5), amplitude 7.0 μ V (± 2.1), nerve conduction velocity 52 m/s (± 4); Table 1 summarizes our findings.



Dumitru et al. technique for the posterior cutaneous femoral nerve

Figure 1:

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	Sex	age	Onset latency	Duration	Amplitude	Distance	Nerve conduction Velocity
Female	43	59,21 45-70	2,02 1,89-2,12	1,5 1,02-1,90	7,4 6,61-7,72	118,98 117-119	51,8 51-53,2
Male	15	59,25 44-69	2,04 1,88-2,15	1,42 1,09-1,94	7,37 6,64-7,74	118,97 117-119,1	52,02 51,4-53,2

Table 1:

Conclusion

The assessment of the posterior femoral cutaneous nerve is simple and reproducible and can provide auxiliary information on the proximal sensory innervation of the lower limbs, including the perineal region. The results of this standardization were similar to the ones described in international literature.

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