

The relationship of infrapatellar nerve to the sartorius and study on the frequency of occurrence of its different positions

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During meniscectomy and anteromedial incision for pes anserinus plasti (slocum) operations on the knee, the infrapatellar nerve may be severed. As a result, in the postoperative period some complaints related to nerve incision may occur. In our study which was carried out on 21 cadavers we observed that infrapatellar nerve has a relationship to the sartorius in three different positions. The first of these was where infrapatellar nerve emerged at the posterior border of the sartorius with a rare of 71.5%. This was followed, respectively, by penetrating (23.8%), the infrapatellar nerve emerging from the body of the sartorius and, anterior (4.7%) infrapatellar nerve emerging from the anterior border of the sartorius. [Turk J Med Res 1993; 11(1): 8-10]

Key Words: Infrapatellar nerv the sartorius muscle

Three bones, the distal end of the femur, the patella and the proximal end of the tibia-take part in the formation of the knee joint which is the largest and most complicated joint in the body. Thus, many ligaments and tendons took part in protecting the stability of this wide joint surface.

Knee is affected with direct or indirect trauma during traffic accidents in which especially cyclists and motorcyclists are involved or from sports injuries.

On the knee, strains occurring during rotation movements may cause ruptures in different regions of lateral and medial meniscus. The course of infrapatellar nerve gains importance because of anteromedial knee incisions applied during meniscectomy, and pes anserinusplasti (slocum) operations (1).

During the above mentioned operations, the infrapatellar nerve may be severed (2-4). Thus, due to paresthesia around the incised area and neuroma developed on the tip of the incised nerve in postoperative period, pain responding to local anesthetics may occur (5,6). In Jonson's study, anteromedial incisions were

evaluated, in 35 out of 76 patients, no numbness was present, while, in others numbness related to nerve incision and related functional disorders were found in postoperative period (4).

The femoral nerve, the largest branch of the lumbar plexus (T12, L1, L2, L3, L4), reaches anterior aspect of thigh passing under the inguinal ligament, through lacuna musculorum, with the iliopsoas. It provides motor branches during its course within femoral triangle. The saphenous nerve, the largest femoral cutaneous branch, penetrates the adductor (subsartorial) canal (Hunter canal) from about the top of femoral triangle. The saphenous nerve runs together with the femoral artery and vein, pierces vastoadductor lamina before reaching the lower tip of the canal. Then in the medial aspect of the thigh, at the posterior aspect of the sartorius, it pierces fascia lata and proceeds along with great saphenous vein subcutaneously (7).

Infrapatellar nerve during its course is in relationship with the sartorius in different positions by passing its anterior and posterior aspects, and through it.

The anatomical relationships of the infrapatellar nerve with the sartorius have clinical importance. The aim of our study is to fully describe the course of the infrapatellar nerve and its different positions.

MATERIALS AND METHODS

We carried out this study on 21 lower limbs. Four of these were obtained from cadavers and 17 from fresh

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amputated limbs. In 17 amputated limbs, it was impossible to determine sex, nine were the right and eight were the left limbs. All of the 4 limbs obtained from the practical work material were from woman cadavers (2 were right and 2 were left).

Through an incision from medial section, skin and subcutaneous tissue were opened. Infrapatellar nerve was reached through carefully dissecting fascia lata along the course of the sartorius.

RESULTS

As a result of dissections carried out, on 15 cadavers infrapatellar nerve parted with saphenous nerve right at the posterior aspect of the sartorius. Twelve nerves which ran a posterior course extended to prepatellar region crossing the sartorius as soon as they pierce fascia lata. In 3 cadavers, infrapatellar nerve, after becoming superficial, descended for a while parallel to the sartorius and then crossed the sartorius in order to

reach prepatellar region. In one of these, infrapatellar nerve parted saphenous nerve in two branches (Figure 2). In 1 cadaver, infrapatellar nerve pierced superficial fascia passing before the sartorius (Figure 1). In 5 cadavers, infrapatellar nerve ran its course piercing the sartorius (Figure 3) (Table 1).

DISCUSSION

During operations on the knee, especially due to anteromedial incision, infrapatellar nerve may be severed and as a result, numbness may occur (2). In our study we obtained the results shown in Table 1. As seen in the table, there is not a significant difference between right and left limbs.

There has been only one publication with which we could compare our results. The results of the study carried out by A. Arthornthurasook et al. on 41 cases compared to the results of our study are shown in Table 2 (2).

The above-mentioned researchers determined the positions of infrapatellar nerve according to its relationship to the sartorius. However, although it is in posterior position, they chose to indicate parallel course separately. We believe it would be better to examine parallel position as a subgroup within posterior position.

We obtained the total number of cases running posterior and parallel, and compared these with our results. We could not find a significant difference between groups ($p > 0.05$).

Again in the same publication, researchers provided some results of measurements about the distance between the point infrapatellar nerve crossed the sartorius and the most projecting point of medial femoral epicondyle in order to provide a guide to the clinicians. However, since body features of people differ and the course of infrapatellar nerve vary a great deal, we consider that this evaluation is not adequate.



Figure 1. The infrapatellar nerve runs at the anterior aspect of the sartorius (right lower limb, cadaver number 8). A. The infrapatellar nerve, B. The sartorius, C. Patella

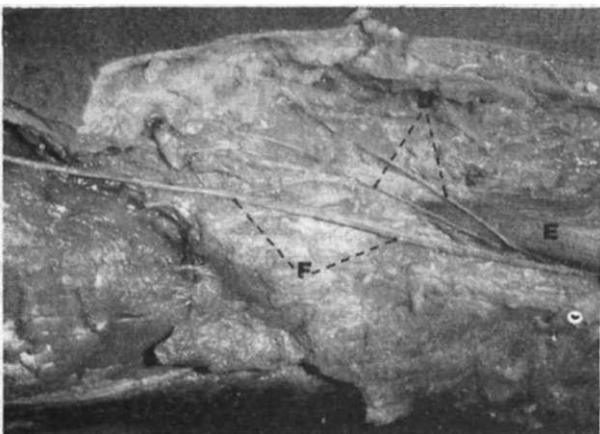


Figure 2. The infrapatellar nerve runs at the posterior aspect of the sartorius (right lower limb, cadaver number 12). A. The infrapatellar nerve, B. The sartorius, C. The saphenous nerve

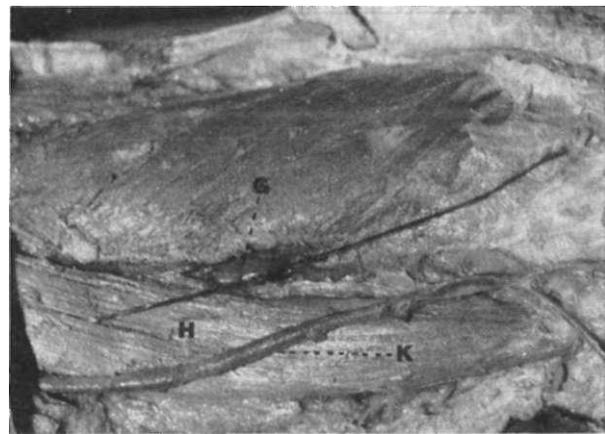
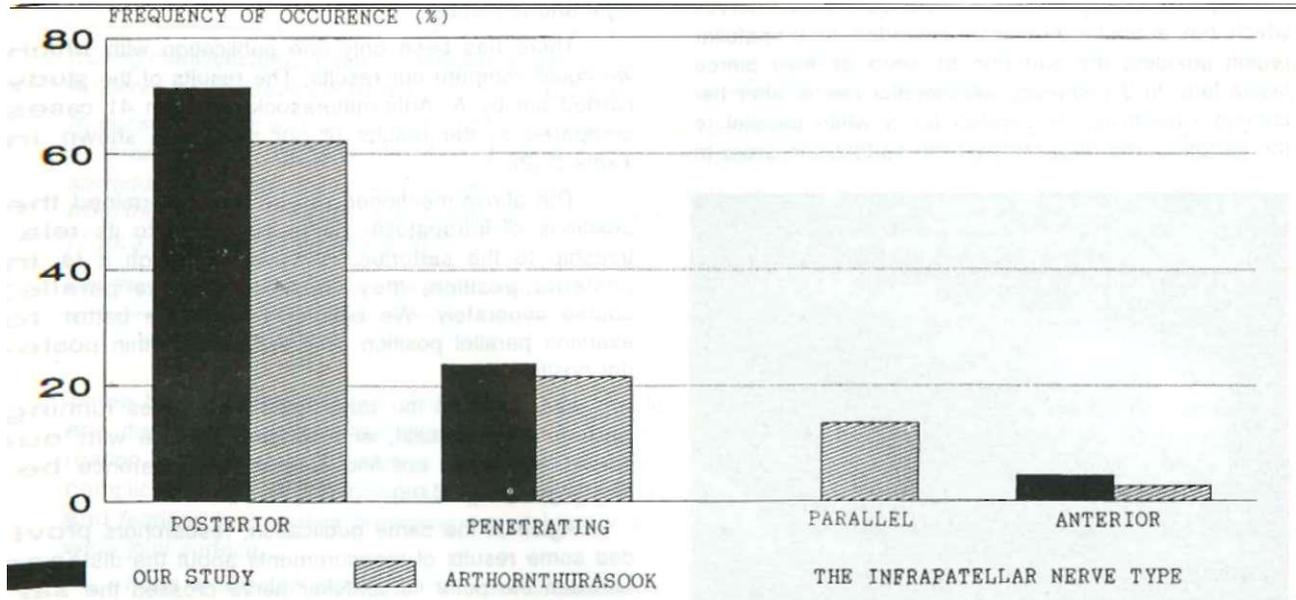


Figure 3. The infrapatellar nerve penetrates the sartorius (left lower limb, cadaver number 3). A. The infrapatellar nerve, B. The sartorius, C. Great saphenous vein.

Table 1. Different relationships of infrapatellar nerve to the sartorius and its frequency of occurrence

| Type | Number of Case | | | | Frequency of Occurrence % |
|-------------|----------------|------|------------|------|---------------------------|
| | Cadaver | | Amputation | | |
| | Right | Left | Right | Left | |
| posterior | 1 | 1 | 8 | 8 | 71.5 |
| Penetrating | — | 1 | 1 | 3 | 23.8 |
| Anterior | | | | | 4.7 |
| Total: 21 | | | | | 100% |

Table 2. Figure illustrating the frequency of occurrence of positions of infrapatellar nerve in our study and in Arthornthurasook's and his colleagues' study



In conclusion, knowledge about the anatomy and variations of the infrapatellar nerve is important for surgical approach. If the surgeon is fully aware of the possible anatomical variations, this nerve will, thus, be prevented from accidental damage during operations.

Nervus infrapatellaris'in musculus sartorius ile olan komşulukları ve farklı konumlarının görülme sıklığı hakkında incelemeler

Diz ekleminde uygulanan menisektomi ve pes anserinus plastisi (Slocum) ameliyatı için yapılan antero-medial kesiler sırasında, n. infrapatellaris kesilebilmektedir. Bunun sonucu olarak da, postoperatif dönemde sinir kesişine bağlı bazı yakınmalar ortaya çıkmaktadır.

Yirmi bir tane preparatta yaptığımız bu çalışma sonucunda n. infrapatellaris'in m. sartorius ile üç farklı konumda komşuluk yaptığını gözlemledik. Bunlar içinde %71.5'lik oranla birinci sırada n. infrapatellaris'in m. sartorius'un arkasından (posterior) çıktığı grup bulunmaktaydı. Bunu sırayla, gelen (%23.8, n. infrapatellaris'in m. sartorius'u dele-

rek yüzeyelleştigi grup) ve son olarak da anterior (%4.7 n. infrapatellaris'in m. sartorius'un önünden çıktığı grup) yerleşim şekli takip etmekteydi.

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