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SOME VARIANTS OF BLOOD SUPPLY AND INNERVATION OF THE GLUTEAL AND POSTERIOR FEMORAL AREAS IN FETUS

Summary. *Macroscopic research of intramuscular nerves and blood vessels in a deepness of the external pelvic muscular group and posterior muscles of thigh held on 12 preparations of human fetuses 6-7 month old. There were identified additional sources of innervation of quadratus femoris muscle and internal obturatory, gemelli, biceps and semitendinosus muscles. Gates that nerves entering into deepness of the pelvic and thigh muscles are not always coincide with the places where arteries enter there. Direction of intramuscular nerves and arteries in thickness of the muscles as well as the type of branching in the same muscle can be different.*
Key words: *skeletal muscle, blood vessels, nerves, fetus.*

Introduction

Severe injuries of the pelvis and lower extremities, usually accompanied by damage of nerves and blood vessels. Features of branching of nerves and blood vessels deep in the muscles of the pelvic girdle and hip have not only theoretical but also practical importance, since the surgical interventions should consider not only the typical topography of neurovascular structures which go to the muscles, but also character of their branching in the muscle thickness and possible anatomical variants [1, 3, 4]. First of all it is important to know what direction intramuscular nerves during surgery on the muscles so flap separating, to cut parallel to their course. Features of intramuscular branching nerves and arteries of the gluteal muscles in the back and hip areas should be considered when conducting operations on the muscles of the lower extremity. However, topographic anatomical relationship between vessels and nerves in the muscles of the pelvis and hips in literature sources fragmentary [2, 3, 5-7].

The *aim* is to establish variants of topography of vessels and nerves of the gluteal and posterior femoral areas of fetus in age 6-7 months.

Material and methods

Macroscopic research of intramuscular nerves and blood vessels in a deepness of the external pelvic muscular groups and posterior muscles of thigh held on 12 preparations of human fetuses 186,0-270,0 mm of parietal-coccygeal length (PCL).

Results. Discussion

According to our research the branching of the superior gluteal nerve is located primarily within the upper and middle thirds of minimus gluteal muscle. Thin nervous fibers pass to the intramuscular arteries and they are situated along these vessels. Branches of superior gluteal nerve are located evenly in the different layers of middle gluteal muscle, also there were found additional sources of innervation. In the study features innervation of middle gluteus muscle and hip muscle square in the fetus 250.0 mm PCL found additional sources of their innervation, namely nerve trunk length 8.0 mm, which was heading from the sacral plexus to the middle of the sciatic muscle and nerve trunk length 12.0 mm, which depart from the sciatic nerve to square thigh muscle. Branching of inferior gluteral nerve is concentrated in the upper and lower parts of the gluteus maximus muscle. Superior gluteral artery on its way pays 1-2 branches to the piriform and internal obturatory muscles, and after leaving the pelvic cavity is divided into superficial branch that supplies gluteus maximus and medius muscles and deep branches, feeding gluteus medius and minimus muscles and tensor fasciae latae muscle. Also lateral circumflex femoral artery participates in the blood supplying of gluteus medius and tensor fasciae latae muscles. Inferior gluteal artery supplies gluteus maximus muscle and gives off an accompanying artery of schiatic nerve.

Muscle branch of the sacral plexus distributed mainly in the upper parts of the upper and lower muscles twins. In fetuses of 205.0 mm and 240.0 mm of PCL muscular branches of the sacral plexus are located in the lower part of inferior gemellus muscle. In fetuses of 230.0 mm and 260.0 mm of PCL nervous fibers of sciatic nerve are involved in innervation of gemelli muscles. Branch of the obturator nerve innervates the external obturator muscle, nerves branches in medial parts of the muscle. Front twig of obturator artery passes on external obturator muscle downward, supplies it and upper parts of adductors muscles. Also in innervation of internal obturator muscle of in fetuses 210.0 mm and 270.0 mm PCL participating branches of the sciatic nerve and in the fetus 195.0 mm PCL - a branch of the pudendal nerve. Front obturator artery branch goes on external obturator muscle down blood supply of last and upper thigh muscles afferent. Posterior branch of obturator artery goes dorso caudal to the outer surface of obturator membrane and provides blood of external and internal obturator muscles. In pear muscle blood supply also participate lateral branches of lateral sacral arteries. Deep in the middle branch circumflex femoral artery is placed between the external obturator muscle and squared thigh muscle and is involved in the blood supply of the above-mentioned muscles.

It should be noted that the two-headed thigh muscle - a muscle that is lost in its structure metameric, with also obliterated tracks in the film metameric intramuscular nerve distribution and only in a short head muscle observed

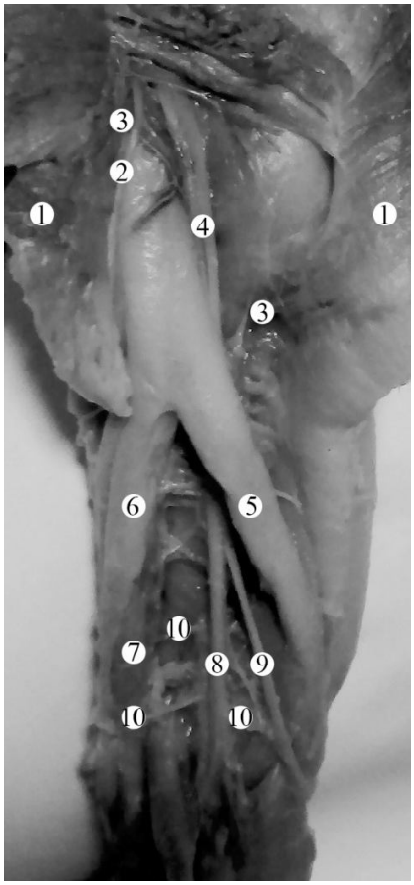

Fig. 1. The right sciatic and posterior femoral areas of the fetus 210.0 mm PCL. Macropreparation. Increase 1,8h: 1 - a large gluteal muscle; 2 - lower sciatic nerve; 3 - lower sciatic artery; 4 - sciatic nerve; 5 - the long head of the biceps muscle of the thigh; 6 - semitendinosus muscle; 7 - semimembranosus muscle; 8 - tibial nerve; 9 - common peroneal nerve; 10 - branches of the popliteal artery.

segmental structure arterial blood supply. From the sciatic nerve to the long head of the biceps muscle of thigh mostly sent 3-5 muscle branches, and to its short head goes, usually one branch, sometimes two, of the total peroneal nerve. In rare cases (fetus 210.0 mm, 240.0 mm, 255.0 mm 270,0mm PCL) in the innervation of distal part of the long head of the biceps muscle of thigh muscle involved tibial nerve branches. To biceps muscle of thigh artery and nerves heading from his front surface, and the place of occurrence of the arteries in the thigh biceps muscle do not coincide with places of entry nerves. Branching of nerve trunks of sciatic nerve in the thickness of long head of the biceps muscle and thigh intramuscular nerve trunks of total peroneal nerve in the thickness of muscle of short heads preferably have a mixed type of branching and downward direction. Pierce artery of the deep femoral artery providing blood of drive muscles, biceps muscle thighs, semimembranosus and semitendinosus muscles. It should be noted that the arteries that provide blood to the short head of the biceps muscle hips, get into the thick of his long head, giving blood to distal part. Intramuscular artery of long head of biceps thighs placed fan-shaped and give the ascending, transverse and descending branches. In the long head of the biceps muscle thigh intramuscular nerve trunk placed in front of the arteries, and the short head muscle - behind. In semimembranosus muscle of blood vessels and nerves are over the outer edge of the muscle. Typically semimembranosus muscle receives blood by 3-6 arterial branches from different sources. In the thick semimembranosus muscle nerve trunks direction coincides with the direction of the arteries, while net of arterial anastomosis hardly developed. In the thickness direction semitendinosus muscle nerve trunks, which depart from the sciatic nerve, coincides with the direction the arteries. Muscle branches, including 2-4 from sciatic nerve mostly sent to the proximal and distal part of the semitendinosus muscle. Also in semitendinosus muscle innervation within its proximal part can take part lower branches of the sciatic nerve (fetus 200.0 mm, 255.0 mm and 270.0 mm PCL), and within the distal part of the muscles - tibial nerve branches (fetus 210.0 mm, 240.0 mm, 270.0mm PCL). Distal regions biceps muscle of thigh, semitendinosus and semimembranosus muscles get blood by 3-5 muscular branches of the popliteal artery (Fig. 1).

It should be noted that more arterial branches than nerves penetrate the thickness of the external pelvic muscles and the rear muscles of the thigh, and the nerve entry gates do not always coincide with the places of arteries. In the thick gluteal muscles and posterior femoral artery anastomosis sites to each other with the formation of arterial grid. Directions intramuscular nerves and arteries in the thickness of the aforementioned muscles in human fetuses, and the type of their branching in one and the same muscle may be different.

Conclusions and recommendations for further development

1. The source of the innervation of muscles of the external pelvic and back thigh muscles are branches of the sacral plexus. In the thick of muscle above branching nerves placed uneven. In fetus gemelli muscle and quadratus femoris muscles are innervated by sciatic nerve; gluteus medius muscle - by the branches of sacral plexus; internal obturatory muscle - by branches of the sciatic and pudendal nerves. The sources of the innervation of the biceps femoris muscle are sciatic, tibial and common peroneal nerves. In innervation of semitendinosus muscle within its proximal part can take part lower branches of the sciatic nerve, and within the distal part of the muscles - tibial nerve branches.

2. Muscles of gluteal and posterior thigh areas are supplied by branches of internal iliac, femoral and popliteal arteries. In the thickness of the muscles more arteries enter in compare with nerves, and the nerve entry gates do not always coincide with the entry of places of arteries. Arteries in the thickness of gluteal muscles and posterior femoral muscles anastomose each other and form vessel net. In human fetuses direction internal muscle nerves and arteries deep in the muscles the aforementioned and type of their branching in one and the same muscle may be different.

Subsequently, plans to explore variations of innervation and blood supply of other groups thigh muscles in human fetuses that will allow to predict their topography in adulthood.

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Пришляк А.М., Реминецкий Б.Я., Стахурская И.О., Щур О.М.
НЕКОТОРЫЕ ВАРИАНТЫ КРОВОСНАБЖЕНИЯ И ИННЕРВАЦИИ МЫШЦ *ЯГОДИЧНОЙ И ЗАДНЕЙ БЕДРЕННОЙ ОБЛАСТЕЙ У ПЛОДОВ*

Резюме. *Макроскопическое исследование особенностей кровоснабжения и иннервации наружных мышц таза и задней группы мышц бедра проведено на 12 препаратах 6-7 месячных плодов человека. Выявлены дополнительные источники иннервации квадратной мышцы бедра, внутренней запирательной и близнецовых мышц, двухголовых мышц бедра и полусухожильной мышцы. Ворота вхождения нерва в толщу наружных мышц таза и мышц задней группы бедра не всегда совпадают с местом вхождения артерий. Направление внутримышечных нервов и артерий в толще мышц ягодичной и задней бедренной областей у плодов человека, а также тип их ветвления в одной и той же мышце может быть разным.*
Ключевые слова: *скелетные мышцы, сосуды, нервы, плод.*

Пришляк А.М., Ремінецький Б.Я., Стахурська І.О., Щур О.М.
ДЕЯКІ ВАРІАНТИ КРОВОПОСТАЧАННЯ ТА ІННЕРВАЦІЇ М'ЯЗІВ СІДНИЧНОЇ ТА ЗАДНЬОЇ СТЕГНОВОЇ ДІЛЯНОК У ПЛОДІВ

Резюме. *Макроскопічне дослідження особливостей кровопостачання та іннервації зовнішніх м'язів таза і задньої групи м'язів стегна проведено на 12 препаратах плодів людини віком 6-7 місяців. Виявлено додаткові джерела іннервації квадратного м'яза стегна, внутрішнього затульного і близнюкових м'язів, двоголового м'яза стегна і півсухожилкового м'яза. Ворота вступу нервів у товщу зовнішніх м'язів таза і м'язів задньої групи стегна не завжди співпадають із місцями входження артерій. Напрямок вутрішньом'язових нервів і артерій у товщі м'язів сідничної та задньої стегнової ділянок у плодів людини, а також тип їх галуження в одному і тому ж самому м'язі може бути різним.*
Ключові слова: *скелетні м'язи, судини, нерви, плід.*

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ХАРАКТЕРИСТИКА СТРУКТУРНИХ ОСОБЛИВОСТЕЙ НИРОК В УМОВАХ ПРИГНІЧЕННЯ ФУНКЦІЇ ЩИТОПОДІБНОЇ ЗАЛОЗИ

Резюме. *Проведено морфометричне, гістологічне та електронно-мікроскопічне дослідження нирок щурів із пригніченням функції щитоподібної залози шляхом щоденного введення 4(6)метил-2-тіоурацилу в дозі 12 мг/кг впродовж 30 діб. Встановлено зміни в ниркових тільцях, звивистих канальцях нефрона та артеріях малого діаметра, що мали компенсаторно-пристосувальний характер.*
Ключові слова: *нирка, пригнічення щитоподібної залози, нефрон, артерії.*