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SCIENTIFIC EXPLORATION:
BRIDGING THEORY
AND PRACTICE

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REGARDING THE ISSUE OF THE PATELLAR LIGAMENT

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Introduction (Relevance): The available literature lacks sufficient data on the biometrics of this ligament. The patellar ligament and the patella are frequently studied in morphological research, but they have been examined separately. The ligament has mostly been studied microscopically, while the patella has been analyzed using macerated specimens. In clinical practice, the patella and its ligament are considered as a single unit, especially in radiographic diagnostics of closed patellar ligament injuries. The surgical treatment of ligament ruptures, as well as the use of the medial third of the patellar ligament for anterior cruciate ligament reconstruction, depends on the size of the patellar ligament.

Objective of the Study: To analyze the morphological features of the patellar ligament.

Materials and Methods: The study of the patellar ligament and patella was conducted on 60 knee joints belonging to adult individuals, predominantly males, aged 25 to 80 years. The dissected joints were fixed in a mild formalin solution.

Results and Conclusions: Before measurements, the patellar ligament was detached from its tibial attachment to study the contours and attachment area and precisely determine its distal end. The patellar ligament length was measured from its superior attachment to the tibia, while the maximum and minimum lengths of its edges were also recorded. The ligament width was measured at three levels: near the patellar apex, at the middle third, and at its tibial attachment. The thickness was recorded at four points along both ends of the ligament. The thickness of the articular cartilage was assessed in 10 patellae using a series of cross-sections.

The width of the patella was on average 1.5 mm greater than its height, though this difference was not statistically significant. The patella exhibited less variability in its dimensions compared to its ligament. The patellar ligament showed less variation in length and width at the upper and middle thirds, while its lower width and thickness

demonstrated high variability. The lateral edge of the ligament was longer than the medial edge. The width of the ligament decreased from the proximal to the distal end, but the difference between the upper and middle sections (~ 2.0 mm) was statistically insignificant. The thickness of the ligament's edges was nearly uniform.

The attachment surface of the ligament to the tibial tuberosity varied in shape and ranged from 191 to 665 mm², with an average area of 410 ± 21 mm² ($\sigma = \pm 115$; $V = 28\%$). A moderate inverse correlation was found between patellar length and ligament length ($r = -0.4$; $m(r) = \pm 0.08$). A weak direct correlation was observed between patellar width and the width of the ligament's middle third ($r = +0.25$; $m(r) = \pm 0.1$).

On the articular surface of the patella, which is divided by the articular ridge into lateral and medial parts, isolated articular facets were identified. The most consistent was the marginal medial facet, while the proximal medial and lateral (flexion) facets and the distal medial and lateral (extension) facets were less consistent. In 42 cases, the marginal medial facet was present, with a width ranging from 6 to 14 mm, averaging 9.3 ± 0.2 mm ($\sigma = \pm 1.85$; $V = 20\%$). In 18 specimens, this facet was separated from the rest of the articular surface by a cartilaginous ridge, which, based on patellar cross-sections, did not always correspond to a bony ridge. The slightly convex surface of the marginal medial facet faced more medially than anteriorly.

During knee extension, this facet did not contact the femoral articular surface, but at 90° of flexion, it contacted the lateral surface of the medial femoral condyle. This contact increased under load, such as when kneeling. Thus, the marginal medial facet of the patella should be considered one of the stabilizing structures of the knee joint. Other facets were noted in only a small number of cases.

The thickness of the patellar articular cartilage, measured at 15 points, varied from 1.5 to 6.0 mm. Cross-sections of the patella were made: the first through the middle of the articular surface, the second and third through the middle of the upper and lower halves of the same surface.

If we assume that greater cartilage thickness corresponds to higher load-bearing areas, the most stressed region is the center of the lateral articular surface of the patella, followed by the border of the medial surface with the marginal facet, and so on.

ПОРІВНЯЛЬНИЙ АНАЛІЗ ЕФЕКТИВНОСТІ ПЕТ-КТ ТА МРТ У ДІТЕЙ З ФАРМАКОРЕЗИСТЕНТНОЮ ЕПІЛЕПСІЄЮ

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Актуальність. Останніми роками як у світі, так і в Україні фіксується збільшення випадків захворювань нервової системи у дітей, особливо серед немовлят до одного року. [1, 2]. Епілепсія є одним із поширених захворювань нервової системи. Судомні напади та аномальна нейрональна активність, що