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Onomatology of the Term Patela: From Ancient Greece to America

Onomatología del Término Patela: Desde la Antigua Grecia hasta América

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SUMMARY: The purpose of this study was to conduct a historical analysis of the terms “patella" and "rotula" according to its onomatology to name the sesamoid bone in the anterior region of the knee and to determine whether it corresponds to international anatomical terminology use. For the study, 46 well-conditioned sesamoid bones were selected. They were measured by using a digital gauge to determine their geometric shape and then compare these with the given meanings throughout history. Results show that the dimensions obtained from these sesamoid bones do not correspond to a thumbwheel shape (rotula), instead they correspond to a dished shape (patella). This coincides with the term used in the current Terminologia Anatomica. The patella term to name the sesamoid bone in the anterior region of the knee is the most appropriate and accepted term in international anatomical terminology.

KEY WORDS: History; Patella; Terminology.

INTRODUCTION

Anatomy is one of the most important basic sciences in all schools of medical education (Davis *et al*., 2014). This discipline has its own language, the Terminologia Anatomica, by means of which the different corporal components can be accurately described and understood in the same way by all the readers (Grelsamer, 2005) worldwide. This also facilitated communication within the scientific community (Duque Parra *et al*., 2002).

It is presumed that the study of anatomy is as ancient as man himself, which perhaps arose from the curiosity of the first settlers, when they examined the open wounds of their congeners and the interiors of those animals that hunted for their subsistence. (Duque Parra *et al*., 2012). In the present study, we observed the existence of some body structures, whose shape, location and anatomical relationships were similar to those seen in other living beings. The names those structures were given, were recognized and orally transmitted to the next generations, long before the invention of writing. It is presumed that this prehistoric knowledge was lost in time.

With the invention of some form of writing during the bronze age, approximately at the end of the fourth millennium BC, man begins to leave his impressions imprinted on small clay chips (Schmandt-Besserat, 2002). These later evolved into tablets of clay, slightly larger, on which information was recorded (Rudgley, 2000). Apparently, writing arose initially because of man's need to express what his eyes saw, doing so through pictograms (Yule, 2007). That is to say, through the representation of figures of animals and objects without any connection. Later, this type of writing was developed into a slightly more complex form, with the creation of ideograms, resulting from the combination of pictograms (Yule), with which man could now express ideas and concepts through geometric symbols. However, there are no records of the exact moment in which man begins recording his knowledge about the human body, or the names that different structures were given, by this type, or any other type of writing.

Just as the first attempts at writing began in Sumer, it is likely that this also occurred in pre-Columbian America, long before the arrival of the first Europeans in America. Indigenous communities of that time, especially the Maya, Aztecs and Incas, had already established a system of writing, which for some was pictographic, while

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others considered it a complete phonological system (Cardona, 1994). Through this type of pre-Columbian writing the natives left their ancestral knowledge, including possibly some kind of anatomical knowledge. However, with the arrival of the conquistadors, especially the Spaniards, characterized by their greed, plundering and abuse (Fernández de Oviedo, 1996), these communities, their culture (De las Casas, 1985) and their ancestral knowledge were destroyed. In time, much of the language and terms used by the different indigenous communities were also lost. This also became apparent, with the arrival of the first Spanish physicians in the 16th century, particularly in Colombia, accompanied by barbers (surgeons) and bleeders (Amezcua Martínez, 1997). The medical and anatomical language used at that time, by these empirical "professionals" becomes evident when in 1790, bleeder Juan Garcia bandaged a patient who had fractured the knee bone, which they called a kneecap or shock (Cortés-García, 2010), but in the International Anatomical Terminology is called patella and appears with the reference A02.5.05.001 (FIPAT, 1998).

MATERIAL AND METHOD

A descriptive study was carried out to determine the geometric shape of the sesamoid bones of the anterior region of the knee. For this purpose, we selected 46 of these bones that were in good condition, belonging to the osteotheque of the Universidad de Caldas, and Universidad de Manizales. They were measured with a digital caliper to determine the dimensions in terms of their length and width, to determine whether the morphometric measurement of this sesamoid bone is more akin to a wheel (rotula) or to a plate (patella). We noted that while studying the bone material, we adhered strictly to the medical legal criteria in the decree 786 of 1990. Furthermore, all principles of the Helsinki declaration for medical research were taken into account, guaranteeing respectful treatment of the parts obtained in the study, and in order to maintain the deceased person's dignity and integrity, their data was kept confidential.

RESULTS

From the 46 sesamoid bones assessed, their width was determined to be between 34.05 mm and 50.96 mm, with an average value of 42.39 mm. While the length of the bones ranges from 31.38 mm to 48.02 mm, with an average value of 40.25 mm. The average values obtained for the width and length of these bones are more or less similar, which allows their semicircular shape to stand out, with the exception of its lower border where the apex is located, thus discarding from this the wheel shape. This bone has two faces, one anterior slightly convex, and one posterior slightly concave, showing a geometric figure that resembles more to a saucer or defense shield.

DISCUSSION

Although Hippocrates, by the fourth century BC, uses the term epimulis (Gersh, 2012) to refer to the knee, it does not refer at all to the sesamoid bone of that region. At the time of the conquest of the Americas, two names were used for this bone, "choque" and "rótula" (Cortés-García). The term "choque" links with "choquezuela", which involves the suffix -uelo, which is very restricted as a diminutive in medieval Castilian (García-Jáuregui, 2009), but is currently accepted in medical language, as can be seen when reviewing several Spanish-language dictionaries (Mascaró y Porcar, 1983) and Spanish dictionaries (Castell, 1985; García-Pelayo y Gross, 1993), as a synonym for the rotula culture (García-Jáuregui, 2006), which incorporated the anatomist Ioan Valverde de Amufco in his book titled "History of the Compounding of the Human Body", 1556 (Valverde de Amufco, 1556). This name was preserved by Spanish physicians and incorporated into knowledge derived from the conquest (De Toro y Gisbert, 1968), which originates from the word "chueca", which refers to a rounded bone or part of it, and which fits into the hollow of another bone, which was used for anatomical formations such as the rotula (Garcia-Jauregui).

The term rótula has been assimilated by the Spaniards and is already recognized in contemporary texts of anatomy, written or translated by them from the original in English (García-Porrero y Hurlé, 2005; Schünke *et al*., 2011; Moore *et al*., 2013), denoting their ignorance or little interest in accepting what is established in the international anatomical terminology. The foregoing indicates that Spanish anatomists and translators do not give the task of consulting the original language which the anatomical terms come from: Latin. The term rotula is the diminutive of wheel (Cadavid-Restrepo, 1942), that is to say wheel (Cruveilhier, 1851; Moliner, 1994) or little wheel, derived from the term "rotella" (Diccionario Ilustrado Latin-Español Español-Latín, 1986), that in the oldest Latin also has other meanings, among them "round and thin shield" (Du Cange *et al*., 1883-1887), which as a formal variant was the most common denomination in Romance languages, but which at the same time is recognized as patella (Terminologia Anatomica) and assimilated in the Castilian with the name of patela.

Thus, the term patella is derived from late Latin, and was documented by Aulus Cornelius Celso (25 BC - 50 AD) in his book "De Medicina", where he talks about the names of the different body parts (Kachlik *et al*., 2009). He is recognized as the greatest authority on anatomical onomatology of his time (Sakai, 2007) and names this bone as patella, which means plate (Mir, 2000) or saucer. While, Valverde in the sixteenth century recognizes it with a round shield form (Valverde de Amufco), with convex face and the other concave, which protects the knee, and not as a wheel. It is also worth noting that in the comments of Berenguer Da Carpi, in 1521, to the Anatomy of Mondino, folio XXXVI and in the margin of the chapter "De Genu", the Latin terms patella and rotula are found. Da Carpi also uses the term "voceusa" as equivalent to patella, which he attributes to Galeno (Bacia Goyanes, 1998).

The term rotula, to designate the sesamoid bone of the knee, is an inadequate term that has been bequeathed to us by the Spaniards and has been perpetuated over time. Fortunately it has been replaced in Terminologia Anatomica by the term patella, which arose even before the term rótula. Therefore, we consider that in Latin America, and particularly in Colombia, the use of those anatomical texts that are edited or translated by Spaniards should be discontinued, since they usually use an outdated anatomical language, saturated with eponymous names and because they do not include international terminology. As the Spanish physician José Celestino Mutis y Bossio asserted toward the end of the 1700, considered the father of Medicine in Colombia (Palacios Sánchez, 1998), making his position clear in the sense that it was not sensible, or convenient to bring teachers from Spain, since it was more practical and economical to use the staff that were in the viceroyalty to prepare physician and surgeons (Cortés-García). The present conquest is made by the weight of reason and experimental demonstration, and then agreed upon worldwide.

CONCLUSION

In agreement with the descriptive study carried out, which shows that in 100 % of the sesamoid bones analyzed none resembles a wheel (rótula), but are rather similar to a plate or to an old shield of defense, by its convex form in the anterior face and concave by its posterior face, we consider that the term "patella", used internationally in the field of morphology and registered in the Terminologia Anatomica with the register A02.5.05.001, is the most appropriate and accepted for the designation of this bone of the knee.

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RESUMEN: El objetivo de este estudio fue realizar un análisis histórico de los términos "rótula" y "patela" según su onomatología para denominar el hueso sesamoideo en la región anterior de la rodilla, y determinar si corresponde al uso de la terminología anatómica internacional. En el estudio, se seleccionaron 46 huesos sesamoideos bien acondicionados, que se midieron utilizando un calibre digital para determinar su forma geométrica y luego compararlos con los significados dados a lo largo de la historia. Los resultados muestran que las dimensiones obtenidas de estos huesos sesamoideos no corresponden a una forma de ruedecilla (rotula), en su lugar corresponden a una forma cóncava (patela). Esto coincide con el término utilizado en la Terminología Anatómica actual. El término de la rótula para nombrar el hueso sesamoideo en la región anterior de la rodilla esel término más adecuado y aceptado en la terminología anatómica internacional.

PALABRAS CLAVE: Historia; Patela; Terminología.

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