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Incidence of Accessory Obturator Nerve – A Case Study

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Abstract
Background and Aims: *The accessory obturator nerve (AON) often innervates the hip joint and adductor longus. The AON is present in 10-30% of patients, and thus it is clinically important that it is also considered during obturator nerve (ON) blockade. The aim of the study is to identify the incidence of accessory nerve.*
Materials and Methods: *The study was performed on 23 cadavers (46 body-sides) and the AON beginning from the lumbar plexus was observed.*
Results: *Throughout the dissections, the AON was detected on five sides (10.8%).*
Conclusion: *Owing to its anatomical structure, the AON can be easily accessed during classical ON blockade. Further clinical studies are needed to investigate if supplementing ON blockade with AON blockade might improve the clinical efficiency and quality of the blockade.*
Keywords: *accessory obturator nerve, lumbar plexus, nerve block.*

Background

Occasionally present, this is small and arises from the ventral branches of the third and fourth lumbar ventral rami. It descends along the medial border of the psoas major, crosses the superior pubic ramus behind the pectineus and divides into branches. One entering the deep surface of the pectineus [1], another supplying the hip joint and a third connecting with the anterior branch of the obturator nerve; sometimes the accessory obturator nerve is very small and supplies only the pectineus, any branch may be absent and others occur, sometimes supplying the adductor longus. An accessory obturator nerve appeared in 69 of 800 dissections.

Accessory obturator nerve is said to be present in about 30% of people. Reported to occur in about 19% to 29% cases. There is a general agreement that this nerve when present, supplies the capsule of the hip joint.

The outgrowing fibers of the obturator nerve may be divided into ventral and dorsal parts by the blastema of the pubis. In such a case the more ventral fibers cross the ramus of the pubis and form the accessory obturator nerve.

Materials and Methods

Ethical clearance of the study had taken.

The present study was carried out on twenty three (23) adult human formalin-embalmed cadavers who were allotted to the undergraduate students for dissection at Osmania Medical College, Hyderabad during October 2011 to September 2012. This study was conducted in Dissection hall of Department of Anatomy, Osmania Medical College.

Dissection Method: The adult cadavers were selected irrespective of their age and sex. The students were allowed to dissect the specimen allotted to them up to the region of the posterior abdominal wall, retaining it intact. The specimens were subsequently cleaned and the branches of lumbar plexus with psoas major muscle intact were identified. Later on the psoas major muscle was removed by piecemeal dissection and the branches were traced back to the roots towards the intervertebral foramina. As the tracing of the nerves to the roots was being done, roots involved in the formation of each nerve was noted and recorded. And presence of accessory obturator nerve noted. Since it was a one-time observation, the observations of the individual specimen were recorded as and when available, it was continued for a period of one year. The photographs were taken and each specimen was serially numbered from 1 to 46 and 1st lumbar to 5th lumbar intervertebral foramina were marked, the side to which it was belonged also specifically mentioned as R and L for right and left sides respectively and the nerves which were observed were named. And especially incidence of accessory obturator nerve observed.

Results

The accessory obturator nerve was found in 5 specimens of the total 46 specimens (10.8%), formed by L3 & L4.

Discussion

Eisler (1891)[2] reported finding the accessory obturator nerve in 8 of 32 cases, a frequency of 25%.

Bardeen [3] in 1906 found the accessory obturator nerve to be present in 21 of 250 specimens, a frequency of 8.4%.

De Sousa (1942) [4] reported a 19% occurrence of the accessory obturator nerve.

Kaiser (1949) [5] found the accessory obturator nerve in two of 24 sides, an 8.3% frequency.

At the termination of the study of 550 sides in 1959, the accessory obturator nerve had been found in 48 specimens, an occurrence of 8.7% reported by *Russell T. Woodburne*[6].

Sim IW, Webb T (2004 Apr) [7] demonstrated the lumbar plexus during cadaveric dissection and found the accessory obturator nerve being identified in 12% of plexuses.

Chandraphak et al (Dec 2003)[8] studied the anatomic variations of the lumbar plexus in Thais and found the accessory obturator nerve occurred in only 3.33% of the cases.

In 2009, *Philip A. Anloague et al* [9] dissected 34 lumbar plexuses to look at the prevalence of anatomical variations in the lumbar plexus and found an accessory obturator nerve, a small nerve arising from the primary anterior divisions of the L3 and L4 nerves that follows along the medial border of the psoas major muscle and then exits over the superior ramus of the pubic bone rather than through the obturator foramen with the obturator nerve to innervate the pectineus muscle and the hip joint was found in 8.8% of the plexuses. In the *Present Study*, out of 46 specimens, the accessory obturator nerve was found in 5 specimens (10.8%) and formed by L3 & L4.

Conclusions

The percentage of presence of accessory obturator nerve was compared with the previous authors. The present study results coincide with those of *Sim IW, Webb T* (Apr 2004). *Chandraphak et al* (Dec 2003) in Thais (Thailand) shows the least percentage of 3.33% and the highest percentage of 25% reported by *Eisler* (1891).

The presence of an accessory obturator nerve has little relevance with regard to differential strength

or sensory loss in patients with suspected obturator neuropathy. The pectineus innervated by the accessory obturator nerve. Normally in absence of accessory obturator nerve, it derives dual innervation from the trunk of femoral nerve and also from the anterior division of obturator nerve. But, due to its small size, contributes little to strength loss with muscle testing. However, unlike the obturator nerve that passes through the obturator foramen, the accessory obturator nerve can be selectively compressed as it courses over the superior pubic ramus. Compression and subsequent neuropathy of a present accessory obturator nerve is a differential diagnostic option in groin pain due to its innervation of the hip joint.

Abbreviations

AON - accessory obturator nerve
ON - obturator nerve

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Conflicts of Interests: None

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