

Nuck cyst, an unusual clinical entity. A case report and review of literature

*Quiste de Nuck, una entidad clínica inusual.
Informe de un caso y revisión de la literatura*

Arturo Jarquín-Arremilla,* Jaime Arón García-Espinoza,*
Fabián Tafoya-Ramírez,** Néstor Alonso Lechuga-García*

Key words:

Cyst of the canal
of Nuck, inguinal
hernia, hernia, female
hydrocele.

Palabras clave:

Quiste de Nuck,
hernia inguinal,
hernia, hidrocele
femenino.

ABSTRACT

Background: A Nuck cyst is an entity produced by the persistence of the processus vaginalis in women, which causes a cyst that according to its relation to the abdominal cavity can be divided into type I, II or III, an inguinal hernia or both simultaneously. There are no precise epidemiological data, since there are only reports and case series, where a nonspecific clinical picture is concluded. **Case report:** We present a 22-year-old female patient with a right inguinal tumor compatible with a right inguinal hernia; she underwent surgical exploration, with findings of a cystic tumor of 15 cm in length containing the round ligament; the histopathological analysis confirmed it was a mesothelial cyst compatible with a type II Nuck cyst. **Conclusion:** Nuck cyst or female hydrocele is a low incidence entity, with no specific clinical picture and non-typical presentation, that can coexist with hernias of the inguinal region. Its diagnosis and treatment are not well established due to the lack of studies; histopathology is an indispensable tool. Nuck cysts should be considered as a differential diagnosis when addressing a tumor of the inguinal region in women.

RESUMEN

Antecedentes: El quiste de Nuck es una enfermedad debida a la persistencia del proceso vaginalis en la mujer, que produce un quiste que según su relación con la cavidad abdominal se divide en tipo I, II o III, una hernia inguinal o ambos al mismo tiempo. No existen datos epidemiológicos precisos; se cuenta sólo con informes y series de casos, con lo que se establece un cuadro clínico no específico. **Caso clínico:** Mujer de 22 años de edad que presenta una tumoración en la región inguinal derecha compatible con una hernia inguinal; se realizó exploración quirúrgica, con el hallazgo de una tumoración quística de 15 cm de longitud que contenía al ligamento redondo; se estableció, por análisis histopatológico, que se trataba de un quiste mesotelial compatible con un quiste de Nuck tipo II. **Conclusión:** El quiste de Nuck o hidrocele femenino es una entidad de baja frecuencia, con cuadro clínico no específico y presentación no típica, que puede coexistir con hernias de la región inguinal. Su diagnóstico y tratamiento no están bien establecidos por la carencia de estudios; en su diagnóstico, el estudio histopatológico es una herramienta indispensable. Así, el quiste de Nuck debe ser considerado como diagnóstico diferencial en el abordaje de una tumoración de la región inguinal en la mujer.

BACKGROUND

In the 17th century, in 1692, Danish anatomist Anton Nuck published *Adenographia curiosa et uteri foeminei anatome nova*, a document where he described for the first time a cystic structure extending up to the labia majora in women. It was 162 years later that Stanley and Skey in 1854 described the condition in depth, naming it "cyst of the canal of Nuck" in memory of Anton Nuck.¹

The cyst of Nuck is an embryonic remnant produced by a failure in the obliteration

of the processus vaginalis in women. This structure accompanies the round ligament from the base of the fallopian tubes to the labia majora; it is an extension of the parietal peritoneum that passes through the inguinal canal (canal of Nuck), which usually obliterates from 8 months to one year of age.² A patent processus vaginalis may result in an inguinal hernia and/or parietal peritoneum cyst with mesothelial epithelium. There are three types of defects: type I, or functioning, in which there is direct communication with

* Department of General Surgery.

** Department of Pathology.

Hospital Regional de Alta Especialidad de Oaxaca, Mexico.

Received: 25/05/2017

Accepted: 25/01/2018

the abdominal cavity and the fluid produced in this zone moves within the cavity; type II, in which the proximal portion of the sac obliterates normally, but not the distal portion, thus forming a cystic space that will enlarge as fluid is produced inside; and finally, type III, also called hourglass type, where there are two cysts, a proximal one that communicates with the abdominal cavity and a distal cyst which is isolated. Out of the three types, type I is the most frequently found in case reports, followed by type II.³

Currently, there are no literature reviews or epidemiological studies comparing therapies or corroborating reliable statistics of this condition; the available information comes from case reports, case series, and anatomic and radiological descriptions. These have revealed that it most often affects women ranging from 17 to 74 years of age, the length ranges from 10 to 110 mm, 80% of cases appear predominantly on the right side and up to 30% of cases coexist with an inguinal hernia.⁴ The global incidence of this disease is unknown. In a number of cases, triggering factors of the condition in adulthood have been described, such as trauma to the inguinal region, local inflammation, and disturbances in peritoneal fluid reabsorption;⁵ however, these are only hypothetical, since there are no studies to prove it.

Clinical findings are unspecific and may include a tumor in the labia majora or a soft and fluctuating inguinal tumor, sometimes reducible and painless,⁶ that does not disappear or increases in volume with changes in position or with the Valsalva maneuver. Some patients may have pain when it is associated with endometriosis,⁷ angiomatofibroma⁸ or adenocarcinoma⁹ inside the cyst. The management of this pathology is still under discussion since there is no proof of choice showing superiority; the final diagnosis is made intraoperatively and with the histopathological report;¹⁰ treatment is based on the surgical removal of the lesion.

CLINICAL CASE

A 22-year old female patient with no relevant history presented spontaneously to the

General Surgery Department outpatient clinic with a two month long symptomatic picture characterized by sudden-onset moderate pain in the right inguinal region (VAS 4/10), of an urgent type, associated with a right inguinal mass of approximately 3 cm in diameter, soft and fluctuating, with no other previous symptoms.

Physical examination revealed a female patient with apparent age corresponding to the age reported, without characteristic facies. At the right inguinal region, a 3-cm diameter painful, soft and fluctuating mass was observed, which did not show changes in its dimensions during the Valsalva maneuver. As part of the diagnostic protocol, a Doppler ultrasound of the inguinal region was performed, showing images suggestive of a 15-cm diameter pseudoaneurysm of the femoral vessels (*Figure 1*). An assessment by the vascular surgery service was requested. The assessment diagnosed an inguinal hernia with involvement of the femoral vessels, so the patient was referred to the general surgery department. Inguinal canal examination was performed, finding an hourglass cystic mass (*Figures 2 and 3*) with a multilobed upper pole and a lower pole with a single cyst ending at the peritoneal level without communication with the peritoneal cavity and housing the round ligament, approximately 15 cm in length, with clear fluid contents. The surgical specimen (*Figure 4*) was sent to histopathological analysis for diagnosis, which confirmed a mesothelial cyst consistent with female hydrocele or cyst of the canal of Nuck (*Figures 5 and 6*).

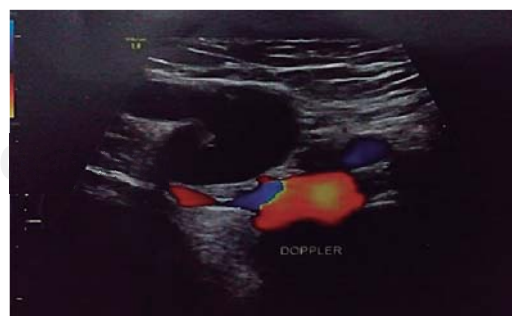


Figure 1. Ultrasound of inguinal region with cystic sac and color Doppler imaging.



Figure 2. Intraoperative finding of an inguinal cyst.



Figure 3. Hourglass-shaped cyst.



Figure 4. Surgical specimen.

DISCUSSION

Female hydrocele or Nuck cyst is an extremely rare condition, but it is a possible differential diagnosis of inguinal mass, and thus it should be approached this way. In their review on the approach to inguinal mass, Trigas-Ferrin *et al.* address inguinal masses taking into

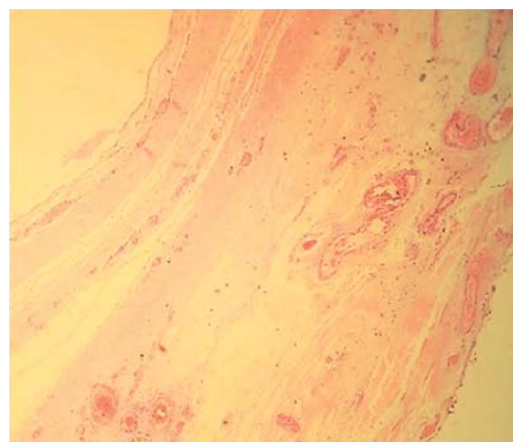


Figure 5. Hematoxylin and eosin staining showing a monolayer of mesothelial cells.

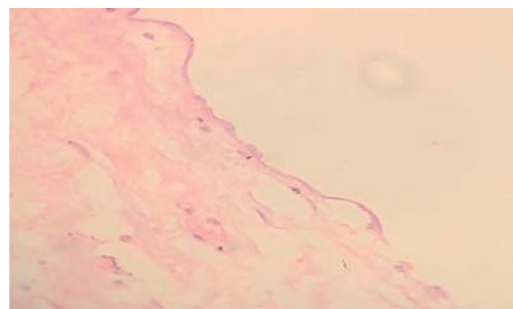


Figure 6. Histopathological close-up view.

account the cyst of the canal of Nuck, as it can sometimes coexist with an inguinal hernia¹¹ (Table 1), and therefore is the first differential diagnosis to consider, besides femoral hernias, enlarged lymph nodes, soft tissue tumors such as lipomas or leiomyosarcomas, and Bartholin's abscesses and cysts. In case of an atypical presentation, endometriosis in the cyst, as well as adenocarcinomas, should be suspected.¹² As an initial diagnostic approach to an inguinal mass, ultrasound¹³ of the region is the most commonly used tool in the reports reviewed, revealing a cystic mass of different shapes. However, it does not identify the origin of the mass nor its dimensions,¹⁴ an advantage of CT SCAN, that accurately defines the origin of the cysts. Nevertheless, for reasons of cost and availability, ultrasound remains the preferred tool, since it allows to differentiate between possible inguinal mass diagnoses, although

Table I. Differential diagnosis between cyst of the canal of Nuck and inguinal hernia.

Symptoms	Inguinal hernia	Cyst of the canal of Nuck
Pain	Painless; may be painful if complicated	Mild or painless
Abdominal symptoms	Nausea, vomiting	None
Dorsal decubitus	Shows changes (disappears)	Does not change
Valsalva maneuvers	Changes	Does not change

Table II. Differential diagnosis by ultrasound imaging.

Condition	Characteristics
Cyst of the canal of Nuck	<ul style="list-style-type: none"> • Anechoic, varying size (10-110 mm) • Non-reducible • No change with Valsalva maneuvers • No abdominal content • Negative Doppler signal

there are no studies that demonstrate its superiority (*Table II*). Reports show that, in most cases, the diagnosis was made intraoperatively and after histopathological examination.

Treatment in most patients was surgical removal⁶ and, if required, reconstruction of the external genitalia.¹⁶ Some authors in the 90s punctured the lesion with subsequent recurrence, so this technique fell into disuse.

It is worth noting that, in the vast majority of reports and case series, surgical specimens are sent to histopathological examination to confirm the diagnosis and to rule out other conditions which may unusually coexist with the cyst of Nuck.¹⁶

CONCLUSION

Despite the low frequency of the disease, the cyst of Nuck must be taken into account as a differential diagnosis in the management of an inguinal mass in women, not only because it is a potential diagnosis but also

because it sometimes coexists with hernias in the inguinal region. There is no consensus on the use of diagnostic aids; further studies are required to demonstrate the superiority of either method. Ultrasound is the most used because of its wide availability in the majority of hospitals and its low cost. The treatment is, in all cases, surgical removal, submitting the surgical specimen to histopathological study to confirm the diagnosis in the first place, and second, to rule out extraordinary conditions such as endometriosis or adenocarcinomas of the cyst. Knowledge of this condition is essential, as it is one of the possible differential diagnoses when treating an inguinal mass.

REFERENCES

1. Garteiz MD, Nieto GS, Bravo TC, Weber SA. Quiste del canal de Nuck asociado con hernia inguinal recurrente. *Ginecol Obstet Mex.* 2013; 81: 52-56.
2. Schneider CA, Festa S, Spillert CR, Bruce CJ, Lazaro EJ. Hydrocele of the canal of Nuck. *N J Med.* 1994; 91: 37-38.
3. Bhosale PR, Patnana M, Viswanathan C, Szklaruk J. The inguinal canal: anatomy and imaging features of common and uncommon masses. *Radiographics.* 2008; 28: 819-835.
4. Núñez J, Núñez L, Delgado M, González A. Quiste del conducto de Nuck: una patología vulvar poco frecuente. *Rev Obstet Ginecol Venez.* 2006; 66: 43-45.
5. Trigas M, Ferreira L. Diagnóstico de masa inguinal, más allá de la hernia inguinal. *Galicia Clin.* 2012; 73: 175-177.
6. Yen CF, Wang CJ, Chang PC, Lee CL, Soong YK. Concomitant closure of patent canal of Nuck during laparoscopic surgery: case report. *Hum Reprod.* 2001; 16: 357-359.
7. Cervini P, Mahoney J, Wu L. Endometriosis in the canal of Nuck: atypical manifestations in an unusual location. *AJR Am J Roentgenol.* 2005; 185: 284-285.
8. Laskin WB, Fetsch JF, Tavassoli FA. Angiomyofibroblastoma of the female genital tract: analysis of 17 cases including a lipomatous variant. *Hum Pathol.* 1997; 28: 1046-1055.
9. Mesko JD, Gates H, McDonald TW, Youmans R, Lewis J. Clear cell adenocarcinoma of the vulva arising in endometriosis: a case report. *Gynecol Oncol.* 1988; 29: 385-391.
10. Caviezel A, Montet X, Schwartz J, Egger JF, Iselin CE. Female hydrocele: the cyst of Nuck. *Urol Int.* 2009; 82: 242-245.
11. Coley WB. Hydrocele in the female (with a report of fourteen cases). *Ann Surg.* 1892; 16: 42-59.
12. Sun CC, Toker C, Masi JD, Elias EG. Primary low grade adenocarcinoma occurring in the inguinal region. *Cancer.* 1979; 44: 340-345.

13. Stickel WH, Manner M. Female hydrocele (cyst of the canal of Nuck). Sonographic appearance of a rare and little-known disorder. J Ultrasound Med. 2004; 23: 429-432.
14. Rathaus V, Konen O, Shapiro M, Lazar L, Grunebaum M, Werner M. Ultrasound features of spermatic cord hydroceles in children. Br J Radiol. 2001; 74: 818-820.
15. Yen CF, Wang CJ, Lin SL, Chang PC, Lee CL, Soong YK. Laparoscopic closure of patent canal of Nuck for female indirect inguinal hernia. J Am Assoc Gynecol Laparosc. 2001; 8: 143-146.
16. Russell JC. Laparoscopic closure of patent canal of Nuck for female indirect inguinal hernia. J Am Assoc Gynecol Laparosc. 2001; 8: 10-11.

Mailing address:

Dr. Jaime Aron García Espinoza

Calle Aldama s/n, paraje El Tule,
San Bartolo Coyotepec, 71256,
Oaxaca, Mexico.

Tel: (+52 55) 951 8080501

E-mail: jaime_506@yahoo.com.mx

www.medigraphic.org.mx