

The Prevalence of Hydatids of Morgagni in Surgically Managed Patients with Gynecological Conditions

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ABSTRACT Objective: To determine the prevalence of hydatid of Morgagni (HM) and describe its clinical features in patients with gynecological conditions. **Material and Methods:** A prospective study was designed to investigate the prevalence of HM. The patients who underwent diagnostic or surgical procedures like laparotomy and laparoscopy to visualize the fallopian tubes for malignant or benign obstetrical/gynecological conditions at a tertiary referral health care from January 2015 to October 2016 were included in the study. We defined HM based on the direct visualization of the tubes at the time of surgery. **Results:** A total of 1,361 patients, 1,066 (78.3%) premenopausal and 295 (21.7%) postmenopausal, were included in this study. The mean age was 39.3 ± 14.7 years (range 18–80 years). The overall prevalence of HM was 17.2% ($n = 235$) and that in premenopausal and postmenopausal women was 18.9% and 11.5%, respectively. HM prevalence was significantly higher among premenopausal women compared to postmenopausal women ($p = 0.003$). The majority (~96%) of the HMs were ≤ 1 cm and in only three cases (0.2%) the HM exceeded 2 cm in diameter. **Conclusion:** A systematic examination and appraisal of the adnexa during pelvic surgery may help in accurately identifying such common cysts. The direct evaluation of the fallopian tubes seems to be the best method to determine the prevalence of HM since most cysts are < 1 cm in diameter. Since the prevalence of HM decreased after menopause, their development may be stimulated by hormones.

Keywords: Fallopian tubes; fallopian tube diseases; paraovarian cyst; prevalence

The hydatid of Morgagni (HM) is one of the most common non-inflammatory conditions of the fallopian tubes.¹ HMs are benign, usually pedunculated, serous-type, fluid-filled, cystic structures arising from vestigial remnants of the paramesonephric ducts. They tend to be solitary, measure up to several centimeters in diameter, and attached to the fimbriated end by stalks of varying lengths.

Although the clinical significance of HM is unclear, a higher incidence of HM is observed in patients with unexplained infertility and in those with adnexal torsion.^{2,3} Recent data suggest that HM plays a much more important role in clinical conditions than previously thought.

The majority of HMs are incidental findings due to their small size and asymptomatic nature. Therefore, the direct evaluation of the fallopian tubes

during surgery can help determine the prevalence of HM, as in our study. The overall prevalence of HM remains elusive largely due to the lack of rigorous studies, although they have been reported in a limited number of patients among the infertile, pediatric and adolescent populations.^{2,4,5}

HM is a common condition that attracts little attention but is potentially significant to warrant further investigations. In this study, the prevalence of HM was determined and its clinical features were described.

MATERIAL AND METHODS

A prospective study was designed to investigate the prevalence of HM in a tertiary referral hospital at the Selçuk University. This study included all patients who underwent diagnostic or surgical procedures like laparotomy and laparoscopy to visualize their fallopian tubes for malignant or benign gynecological conditions at the Department of Obstetrics and Gynecology of the Faculty of Medicine from January 2015 to June 2016. We defined HM on the basis of the direct visualization of the tubes at the time of surgery. The patients with paratubal cysts (PTCs) other than HM, those who underwent recurrent surgery in our hospital during the study period, those who underwent tubal surgery previously, and those in whom it was not possible to assess the fallopian tubes (due to tubal adhesions, fimbrial phimosis, and/or infections, etc.) were excluded.

HMs were not removed and the clinical diagnosis was based on visual examination only. They were measured using a sterile ruler during surgery and stratified into three size categories of ≤ 1 , 1-2, or > 2 cm. Patient age, menopausal status, and HM number, size, and location were recorded.

Data analysis was performed using SPSS for Windows, ver. 17.0 (SPSS Inc., Chicago, IL, USA) and presented as mean (range) \pm standard deviation or as numbers of cases and percentages, where applicable. Chi-square test was used to compare categorical variables. A p -value < 0.05 was considered significant.

All patients who participated in this study were counseled appropriately, and written informed consent was obtained. This study was approved by the Selçuklu Medical Faculty Ethics Committee of Selçuk University. All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

RESULTS

A total of 1,361 patients were included in this study, of which 1,066 (78.3%) were premenopausal and 295 (21.7%) postmenopausal. The mean age was 39.3 ± 14.7 years (range, 18-80 years). The overall prevalence of HM was 17.2% ($n=235$), and that in the premenopausal and postmenopausal women were 18.9% and 11.5%, respectively. The prevalence of HM among premenopausal women was significantly higher than that in postmenopausal women ($p=0.003$).

HMs were observed on the left fallopian tube in 146 of 235 (10.7%) cases, on the right fallopian tube in 123 (9%), and on both tubes in 34 (2.4%) cases. Left-sided lesions were significantly more frequent than right-sided lesions ($p<0.001$). More than one HM was found on one side in 19 (1.4%) cases. Approximately 96% of the HMs were ≤ 1 cm in diameter and only in three (0.2%) cases, they exceeded 2 cm. Patient characteristics, HM prevalence, and surgical procedures are summarized in Table 1-2.

DISCUSSION

PTCs have been reported in all age groups from premenarche to menopause.⁶ HMs, which are usually < 2 cm in diameter, are classified as PTCs if pedunculated, and located near the fimbria of the fallopian tube.⁶ In our study of 1,361 patients, 96.1% of the HMs were < 1 cm in diameter, as reported by Kiseli et al., and only 0.2% HM exceeded 2 cm in diameter.⁶ The overall prevalence of HM in our population, aged 18 to 80 years, was 17.2%. The prevalence of HM in premenopausal

(18.9%) women was significantly higher than that in postmenopausal (11.5%) women, suggesting that hormonal factors may predispose to HM development. Additionally, Muolokwu et al. found that the incidence of PTCs (including paraovarian cysts, hydrosalpinx, and HM) in a pediatric and adolescent population aged 1-19 years presenting with adnexal masses was 7.3%, which is lower than that observed in our study cohort.⁵ Muolokwu et al. hypothesized that these remnants of the paramesonephric or mesonephric ducts increase in size under hormonal stimulation.⁷

Although most HMs are asymptomatic and found incidentally during operative procedures for other indications and thus thought to have no clinical significance, they can lead to clinically significant situations like adnexal torsion, malignancy, and infertility.^{2-4,8} To eliminate the risk of infertility and/or adnexal torsion, some gynecologists have recommended removing HMs that are found incidentally.⁵ The prevalence of HM is mostly unknown, and there is no evidence-based consensus among gynecologists concerning the management of these cysts. Providing medical evidence will add to the available information and demonstrate the utility of evidence-based medical data in all parts of clinical practice, including what some consider unimportant.

Rasheed and Abdelmonem found that >50% of patients with unexplained infertility had HM, and also reported a 35% (401 of 1,141) incidence rate of HM in women undergoing laparoscopy as part

of an infertility investigation.² Since a close fimbrio-ovarian relationship is a crucial factor for egg collection and conception, the displacement of the fimbriae from the ovulatory side due to its weight or disruption of tubal motility with respect to the pick-up and transport of the ovum may be the underlying mechanisms.^{2,4,9} Additionally, compression of the already narrow tubal lumen along with a lack of coordinated muscular contractions or ciliary activity of the fallopian tubes may contribute to this clinical scenario.¹⁰ Patients with unexplained infertility often have a high rate of spontaneous pregnancy after removal of the HM.^{2,4}

Pansky et al. reported that HMs are involved in 26% of all adolescent cases of adnexal torsion.³ The torsion of an HM involving the ipsilateral fallopian tube has been implicated as a cause of acute abdominal pain in adolescents.¹¹ It is not clear how HM contributes to the risk of adnexal torsion, although Cimador et al. and Seshadri et al. reasoned that HM may result in the free end of the tube becoming heavier, excessively mobile, and more susceptible to rotation.^{12,13}

The strengths of the present study are its prospective nature, relatively large sample size, and novelty in terms of investigating the prevalence of HM over a broad age range. The main limitations of the study are the absence of pediatric and adolescent data, and the recruitment of all patients from only a single institution; thus, our results cannot be extrapolated reliably to other demographic groups or geographic locations. Although typical HMs are not difficult to diagnose on gross inspection, we did

TABLE 1: Distribution of patients with hydatid of Morgagni (HM).

	Premenopausal	Postmenopausal	All	Distribution in patients with HM
Patients	1,066 (78.3%)	295 (21.7%)	1,361	
HM prevalences	201 (18.9%)	34 (11.5%)	235 (17.2%)	
Left-sided HM	125	21	146 (10.7%)	62%
Right-sided HM	106	17	123 (9%)	52%
Both-sided HM	30	4	34 (2.4%)	14%
≤ 1 cm	193	33	226	96.1%
1-2 cm	5	1	6	2.6%
>2 cm	3	-	3	1.3%

TABLE 2: Surgical procedures.

Laparotomy	1197
Laparoscopy	164
Benign	1162
Malignant	199
Gynecological	414
Obstetrical	947

not confirm our visual examination by histopathology. Additionally, we did not categorize the patients as fertile or infertile.

HM may be visualized by sonography if the cyst enlarges, undergoes torsion, hemorrhages, or becomes malignant. Since the specific diagnosis of these structures is usually not possible preoperatively⁶, they may go unnoticed, particularly when they are asymptomatic and/or small. Therefore, many HM cases are confirmed only after laparotomy.¹⁴ A systematic examination and appraisal of the adnexa during pelvic surgery may help to accurately identify such common cysts. Instead of imaging methods, direct evaluation of the fallopian tubes seems to be a useful method to determine the prevalence of HM since most cysts are < 1 cm in diameter. The lower prevalence of HM after menopause indicates a hormonal role in stimulating HM development. Further multicenter prospective trials are needed to verify these findings in a larger population comprising of all age groups.

Compliance with Ethical Requirements

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. The informed consent was obtained from all patients for being included in the study.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Mustafa Gazi Uçar, **Design:** Mustafa Gazi Uçar; **Control/Supervision:** Çetin Çelik; **Data Collection and/or Processing:** Mustafa Gazi Uçar, Tolgay Tuyan İlhan, Ayhan Gül, Tansel Çakır, Gülşah Alkan Demir; **Analysis and/or Interpretation:** Tolgay Tuyan İlhan, Çetin Çelik; **Literature Review:** Mustafa Gazi Uçar; **Writing the Article:** Mustafa Gazi Uçar; **Critical Review:** Tolgay Tuyan İlhan, Ayhan Gül, Tansel Çakır, Çetin Çelik; **References and Fundings:** Mustafa Gazi Uçar, Ayhan Gül, Gülşah Alkan Demir; **Materials:** Tolgay Tuyan İlhan, Ayhan Gül, Tansel Çakır, Gülşah Alkan Demir.

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