



An Overview on Etiology, Diagnosis and Management of Ovarian Dermoid Cyst: Simple Review Article

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The most common neoplastic ovarian lesions in teens are mature cystic teratomas (MCTs) or dermoid cysts. Little is known about the cause of dermoid cysts. Elevated levels of estrogen and progesterone have been suggested to stimulate the sebum components of these tumors, which may explain why MCTs grow after puberty and stop growing after menopause. MCTs are often asymptomatic and are randomly identified during examination or diagnostic imaging. MCTs show a special appearance during ultrasonography. Most studies suggest that most ovarian dermoid cysts can be successfully treated surgically using laparoscopic surgery. Reduced adhesion formation is one of the benefits of laparoscopic treatment for dermoid cysts. Studies also suggest that laparoscopy causes less blood loss. Less hospitalization and less postoperative pain. And there are fewer postoperative problems than the laparotomy approach. In this article, we will look at the etiology, diagnosis, and treatment of dermoid cysts in the ovary.

Keywords: *Overview; management; ovarian dermoid cyst.*

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1. INTRODUCTION

The entrapment of ectodermal elements along the lines of embryonic closure causes a dermoid cyst, which is a benign cutaneous developmental defect. These benign tumours have stratified squamous epithelium linings. Although dermoid cysts are congenital, not all of them are identified at birth. Only approximately 40% of dermoid cysts are diagnosed at birth, and only about 60% of dermoid cysts are diagnosed by the age of five. Dermoid cysts appear in children throughout their first year of life and expand slowly. [1-5].

MCTs are slow-growing tumours that grow at a rate of 1.8 mm per year. What causes these lesions to proliferate is unknown. It has been proposed that increased oestrogen and progesterone stimulates the sebaceous gland component of these tumours, which could explain why MCTs become larger after puberty and then stop growing after menopause. In about 10–20 percent of cases, MCTs are bilateral. Immature teratomas make up about 1% of all ovarian teratomas and are made up of tissue from all three germ cell layers, but unlike MCTs, the cells are not fully differentiated and are distributed irregularly. [6].

Because of its improved magnification, lower invasiveness, and shorter hospitalisation, laparoscopy is a significant advancement in surgery. In regular practise, ovarian surgery is one of the most commonly done laparoscopic procedures. Nezhat et al. described laparoscopic removal of dermoid cysts in 1989, and since then, more widespread use of operational laparoscopy has resulted in the treatment of many suspected cases of dermoid cysts. Many studies have demonstrated that laparoscopic adnexal mass removal is safe, even in postmenopausal women who are at a higher risk of developing a malignant ovarian neoplasm. [7,8].

The most serious risk in laparoscopic management of dermoid cysts is spillage of cyst contents, which can lead to problems including chemical peritonitis or cancer spread. Laparoscopy has a 15-100 percent spill rate, whereas laparotomy has a 4-13 percent spill rate. Another complaint of laparoscopy is the risk of cystic components being implanted into the abdominal wall when the cyst is being removed through the surgical channel. There is one case report of implantation leading to bladder and rectum fistulization. This potential complication

can be avoided by carefully removing the cyst with the trocar sleeve and avoiding contact with the abdominal wall. [9].

2. ETIOLOGY

Dermoid cysts have a causation that is very much unknown. The cause of this congenital developmental abnormality is unknown. Prior et al. discovered no link between the location of the dermoid cyst and the patient's sex, histology, or age. [1,4,5].

Ovarian cysts or adnexal masses can have a variety of causes, ranging from physiologically normal (follicular or luteal cysts) to ovarian cancer. Ovarian cysts can develop at any age, however they are more common during the reproductive years and are more common in menarchal females due to endogenous hormone production. Simple cysts are the most common in all age groups, while ovarian lesions that are mixed cystic, solid, or entirely solid have a higher rate of malignancy than simple cysts. Despite the fact that the majority of ovarian cysts are benign, age is the most important independent risk factor, and postmenopausal women with any form of cyst should have thorough follow-up and treatment due to a higher risk of malignancy. [10].

Generally speaking ovarian cyst formation is linked to a number of causes:

- Patients taking gonadotropins or other ovulation inducing drugs may develop cysts as a side effect of ovarian hyperstimulation syndrome.
- Ovarian cysts can occur in the second trimester of pregnancy, when hCG levels are at their highest.
- Hypothyroidism
- Maternal gonadotropins- Maternal gonadotropins may cause foetal ovarian cysts due to their transplacental effects.
- Using cigarette
- Tubal ligation sterilizations have been linked to the development of functional cysts. [10]

2.1 Epidemiology

The most frequent ovarian neoplastic lesions identified in teenagers are mature cystic teratomas (MCTs) or dermoid cysts. These masses are a form of benign germ cell tumour that develops from totipotent ovarian cells into

fully differentiated ectodermal, mesodermal, and endodermal tissue. MCTs are responsible for about 70% of benign ovarian tumours in women under the age of 30 and 50% of juvenile tumours. Because pelvic imaging is not regularly conducted in these groups, the actual prevalence of dermoid cysts in children, adolescents, and non-pregnant premenopausal women is unknown. Just One dermoid cyst was discovered in a study of 335 asymptomatic women aged 25–40 years old utilizing transvaginal ultrasonography [8,11-15].

Dermoid cysts are one of the most common types of tumours in children's heads. In pediatric patients, dermoid cysts represent for 15.4 percent to 58.5 percent of all scalp and skull masses. Dermoid cysts are almost always congenital, with 70 percent of instances occurring in children aged five or younger. There have also been cases of dermoid cysts identified in adults. Dermoid cysts were found to be somewhat more common in girls, according to Pollard et al. This considerable majority, however, has not been observed in other case studies. Although no racial bias is apparent, the majority of instances are described in Whites [8].

2.2 Evaluation

MCTs are frequently asymptomatic and are identified by coincidence during a checkup or imaging. An examination of 517 MCT cases indicated that 60% of patients were asymptomatic at the time of diagnosis, 11% had their tumours discovered accidentally during a laparotomy for another cause, and 39% of patients were symptomatic. Abdominal pain is the most common symptom in women with MCTs, followed by increased abdominal girth, palpable abdominal mass, constipation, nausea, vomiting, and anorexia on a rare occasion. [6].

On ultrasonography, MCTs have a distinct look. The existence of a Rokitansky nodule, fat fluid levels, dermoid mesh, and the "tip of the iceberg sign" are all found on ultrasound. A cystic lesion with a highly echogenic tubercle extending into the cyst lumen is known as a Rokitansky nodule, or dermoid plug. The matrix of echogenic bands created by hair fibers floating within the cyst is referred to as dermoid mesh. The acoustic shadowing that sebum can cause on hair with lesions is known as the "tip of the iceberg sign." Ultrasound can also help distinguish between benign and malignant ovarian tumors. Ovarian volume of 20 cm³ or more, enhanced vascular

supply to a lesion on color Doppler, septations, papillary projections, and heterogeneous tissue echogenicity are all signs of cancer. [8].

There are still several unanswered questions on how to diagnose dermoid cysts. Ultrasound, particularly transvaginal ultrasound, can help in diagnosis. However, because dermoid cysts and malignant ovarian tumours can both have mixed solid components, malignancy is still difficult to rule out with sonography. CA125 tumour indicators are often helpful, but they aren't always enough to diagnose malignancy. As a result, frozen sectioning of suspected lesions and excretions may be required. [9].

Dermoid cysts have the potential to expand intracranially or intraspinally over time. Because of this concern, radiological investigations should be considered before biopsy or manipulation, especially if the lesion is in the midline or on the scalp. Dermoid cyst aspiration or biopsies can cause infection, which can develop to osteomyelitis, meningitis, or a brain abscess. Bony erosions, eyelid dislocation, and intracranial expansion are all possible consequences. [1].

For the examination of adnexal masses, high-quality vaginal ultrasound transducers are now the preferred preoperative work-up method; alternative imaging methods are rarely used in clinical practise. In asymptomatic dermoid cysts, expectant management with a follow-up ultrasonography check may be suitable. Surgical treatment may be required if the condition is linked with adnexal torsion (16%), discomfort, or rupture leading to chemical peritonitis (3–7%). The treatment of a dermoid cyst is thus based on its symptoms and clinical findings rather than the very low chance of actual tumor. Depending on the patient's symptoms, age, clinical findings, and ultrasonographic features, a decision might be made between conservative therapy, laparoscopic surgery, or laparotomy [7].

2.3 Management

Most studies assume that over 80% of ovarian dermoid cysts can be successfully treated surgically utilising laparoscopic procedures, owing to the accuracy with which teratomas can be detected preoperatively. In comparison to open abdominal surgery, a minimally invasive method has a number of advantages, including reduced postoperative pain, a faster recovery period, greater cosmesis, and improved

magnification, which makes peritoneal metastases detection more certain. Increased operating times, increased cost, and other dangers of surgery exclusive to laparoscopy are all disadvantages of laparoscopy. The surgical method selected is mostly determined by operative experience; nevertheless, in the event that surgical staging is required, laparotomy is often favoured with large or bilateral lesions and masses suggestive for malignancy. [6,16, 17].

Dermoid cysts can be removed using the closed approach, which involves extracting an intact cyst within a bag. Teratomas can be harmful if the cyst ruptures and the fluid inside leaks out. After laparoscopic removal of benign cystic teratomas due to spillage, chemical peritonitis and granuloma development with intestinal obstruction have been documented. Several researchers are now advocating adequate intra-abdominal isolation within an Endobag to avoid the most common incidence of leakage after laparoscopic removal of dermoid cysts. Unilateral adnexal grows in women of reproductive age, on the other hand, are benign in up to 95% of instances, and laparoscopic surgery is seen as a less invasive approach for women suspected of having a dermoid cyst. [8].

In a Cochrane review published in 2009, the use of laparoscopy versus laparotomy for benign ovarian cancers was compared. The results of this systematic review, which comprised 12 randomised control studies, showed that laparoscopic surgery was associated with significantly decreased postoperative pain, fewer surgical adverse events, and a shorter hospital stay. Overall, the laparoscopy group had a higher rate of unexpected cyst rupture during operation than the laparotomy group. Despite this, there was no significant difference between the two treatment arms in terms of overall number of surgical adverse events in the subgroup of dermoid cysts. [6,18-21].

In a study that looked at the results of 47 cases treated with laparoscopically for ovarian Dermoid cyst. 93.6 percent of 47 women aged 21 to 53 (median 38.8 years) had a unilateral cyst with a diameter of 17 to 108 mm (median, 51 mm). Cystectomy (57%) was performed, as well as complete (36%) or partial (6.4%) oophorectomy and laparoscopic-assisted vaginal hysterectomy with bilateral salpingo-oophorectomy (2 percent). In 42.5 percent of cases, minimal spillage occurred during cyst extraction, and none of the

patients developed chemical peritonitis. Conversion to laparotomy was required in two patients (4.3 percent), one for sigmoid colon damage and the other for a malignant ovarian tumour discovered via frozen section. The average duration of the operation was 80 minutes (range: 35–180 minutes). [7].

In a study that was done to assess the surgical course and evaluate the efficacy of laparoscopic ovarian cystectomy vs laparotomy. The surgical approach was divided into two groups: laparotomy and laparoscopy. Results: Laparoscopy resulted in much less blood loss. Laparotomy required 6.32 days of hospitalization, while laparoscopy required 3.18 days. Laparoscopy patients had much less post-surgical pain. There were fewer post-surgical problems using the laparoscopic approach. And thus it concluded that Laparoscopy should be the first line of treatment for women with dermoid cysts because it offers several benefits to the patient while also saving money for the national health system. [21].

Reduced adhesion formation is one of the advantages of laparoscopic therapy of dermoid cysts. In a prior study, second-look laparoscopy revealed no adhesions in three patients who had spilling, but mild periovarian adhesions in the one patient who did not have spillage. A total of 56 patients with dermoid cystectomies underwent second-look laparoscopy in a research by Chapron et al. On second-look laparoscopy, eight of the ten patients had intraperitoneal leakage, although only two developed adhesions. Lin also mentioned one patient who had a 12-month follow-up laparoscopy. The patient exhibited little adhesions despite spilling during the previous operational course. [9].

The reported rate of recurrent MCT after cystectomy in adults is 3–4%. There is a 2–3 percent chance of developing germ cell tumours in younger patients with multiple or bilateral MCT. Between 2–24 months after surgery, a retrospective multicenter cohort study of ovarian dermoids eliminated by laparoscopy versus exploratory laparotomy observed significant more ipsilateral recurrences in the laparoscopy group, with the probability of recurrence at two years calculated to be 7.6% by laparoscopy and 0% by laparotomy. It's easy to consider if the rise in ipsilateral recurring teratomas, particularly during laparoscopy, is due to insufficient resection or unnoticed tiny co-existing MCTs at the time of removal rather than actual recurrence. [6].

3. CONCLUSION

Although Dermoid Cyst is considered a benign tumor with slow growing rate, it still opposes considerable challenge. The problem relies on proper diagnostic techniques as such a disease is discovered most of the time by coincidence due to the asymptomatic nature of the disease. With that being said there's still reliable non-invasive and invasive diagnostic techniques. Treatment of the disease using laparoscopic ovarian cystectomy has showed advantage over laparotomy due to less complications, blood lost and shorter hospital time. And thus laparoscopic techniques should be preferred. Spillage and recurrence are complications of using laparoscopic techniques and thus need for better treatment and diagnostic techniques can help improving management outcomes to large extend

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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