CASE REPORT

Bilateral dermoid ovarian cyst in an adolescent girl

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Accepted 14 June 2014

SUMMARY

A 19-year-old unmarried woman with regular menstrual cycles presented with symptoms of vague abdominal pain of 1 month duration. General condition fair. Per abdomen—a firm, non-tender mass corresponding to 26 weeks of gestation with smooth surface, upper and lateral borders well defined, lower border not palpable was observed. Ultrasonography: left ovarian tumour 28×19 cm with mixed echogenicity was seen in the pelvis extending superiorly into the abdominal cavity with fat, fluid contents, multiple septations. Right ovary measures 6×4 cm with 3.7 cm focal hyperechoic lesion. Uterus anteverted, normal size. No free fluid seen. CT confirmed the ultrasonography findings. Cancer antigen (CA) 125 was 52 IU/mL. Exploratory laparotomy followed by left ovariectomy and salpingectomy and right ovarian cystectomy was performed, leaving behind a significant amount of normal ovarian tissue. Cut section of the gross specimen of the left ovarian tumour—dermoid cyst—plenty of sebaceous fluid and a large tuft of hair. The right ovarian cystectomy revealed a dermoid cyst with hair and pellets of sebum. Histopathology showed bilateral dermoid ovarian cyst.

BACKGROUND

Bilateral dermoid cyst in a young, nulliparous woman is a challenging situation as considerable amount of ovarian stroma has to be preserved for menstrual function and future fertility.

There are only a few cases in the literature of bilateral dermoid ovarian cyst in young individuals less than 21 years.

CASE PRESENTATION

Case history: A 19-year-old unmarried woman presented with the symptoms of vague abdominal pain of 1 month duration. There was no history of bowel/bladder disturbances, loss of weight/appetite, no history of menstrual irregularities. No relevant medical and surgical history.

Family history: Patient's younger sister (14 years) was recently diagnosed to have a bilateral dermoid ovarian cyst.

General physical examination

- ▶ General condition—good. Body mass index (BMI) 19.8 kg/m². No icterus, lymphadenopathy, oedema
- ▶ Vital signs—stable
- ▶ Breast/thyroid/spine—normal

Systemic examination

Per abdomen: A 26-week size firm non-tender mass with smooth surface palpable. Upper and lateral borders well defined. Lower border not felt.

Restricted transverse mobility present. No bruit over mass. No ascites.

Per rectal: Rectal mucosa free, same firm mass felt anteriorly.

INVESTIGATIONS

Routine investigations within normal limits

CA125 = 52 IU/mL. Renal function test—within normal limits. Liver function test—within normal limits. Chest X-ray—normal

Ultrasonography: Large left ovarian tumour of 28×19 cm; with mixed echogenicity; with fat, fluid contents and multiple septations. Right ovary measures 6×4 cm with 3.7 cm focal hyperechoic lesion. Uterus—anteverted, normal size. No free fluid seen.

Multidimensional CT of the abdomen and pelvis confirmed the ultrasound findings ([figure 1](#)).

Second opinion: Bilateral dermoid cyst of the ovary.

DIFFERENTIAL DIAGNOSIS

The most probable diagnosis for this 19-year-old patient, when first examined was ovarian tumour. The reason being a 26-week firm mass arising from pelvis, no menstrual discomfort. The next question—What type of tumour?—probably a germ cell tumour as 60% of ovarian tumours less than 20 years of age are germ cell tumours.

Next important aspect was to rule out malignancy. Clinically this case appeared to be a benign tumour as the patient's general condition was good. BMI 19.8 kg/m² no ascites. Therefore, clinically we concluded that it could possibly be a benign tumour of the ovary. Ultrasonography helped us to diagnose the condition as a bilateral dermoid ovarian cyst. Multidimensional CT of the abdomen and pelvis was performed to confirm the diagnosis and to note the amount of normal ovarian stroma.

TREATMENT**Surgery**

Exploratory laparotomy proceeded to left ovariectomy and salpingectomy and right ovarian cystectomy under general anaesthesia.

Laparotomy findings

Left large ovarian dermoid cyst (28×19 cm)

- ▶ Undergone torsion once;
- ▶ Capsule intact, lying free, no adhesions;
- ▶ Tube stretched over it ([figure 2](#)),
- ▶ Partly cystic and partly firm areas, involving the whole of the left ovary.

Right ovary measuring 6×4 cm with a 3.7 cm dermoid cyst—in the posterior aspect. Hair follicles visualised through the cystic wall. Anterior aspect had considerable amount of normal ovarian stroma. Uterus anteverted normal in size.

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To cite: Hakim MMA, Abraham SM. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-205236

Figure 1 CT of the abdomen.

OUTCOME AND FOLLOW-UP

The postoperative period was uneventful. The patient was discharged on the seventh postoperative day after suture removal. Histopathology confirmed the diagnosis of bilateral dermoid ovarian cyst (figures 4–6).

The patient came for follow-up after 1 month and also had a normal menstrual cycle.

DISCUSSION

Dermoid cyst (mature cystic teratoma)

Comprises 10–25% of all ovarian neoplasms. Peak incidence 25–45 years. Dermoid cyst is a benign germ cell tumour (very rarely malignant 1.7% typically in women older than 40 years).

Figure 2 Intraoperative image.

Figure 3 Cut section of the left ovary.

They are bilateral in 10% cases, usually unilocular with smooth surface, contains hair and sebaceous material, lined in part by squamous epithelium. Teeth, bone, cartilage, thyroid tissue and bronchial mucous membrane are also found in the wall. Sometimes the sebaceous material collects together in the form of pellets (figure 3).

Forty per cent of dermoid cysts are associated with mucinous cystadenoma. The nomenclature dermoid cyst is a misnomer as it contains tissues from all the three germ cell layers that is ectoderm, endoderm and mesoderm, but there is preponderance of ectodermal tissue (figure 4).

In the inner surface there is one area of solid projection called Rokitsansky's protuberance which is covered by skin, sebaceous glands and at times teeth and bones. Histological sections should be made from this area (figure 5).

Rarely mesodermal teratomas are present. They are composed either solely or predominantly of one highly specialised tissue type for example thyroid tissue-struma ovarii, it may be associated with hyperthyroidism. Struma ovarii may be benign or

Figure 4 Histopathology of the left ovary.

Figure 5 Histopathology right ovary specimen.

malignant. Ten per cent of dermoid cysts are diagnosed during pregnancy.

Origin of mature teratoma

Theorised to develop from genetic material contained within a single oocyte. The oocytes capable of parthenogenesis result from an arrest of oocyte development following meiosis I. As a result almost all mature cystic teratomas have a 46, XX karyotype.

Complications of dermoid cyst

1. Torsion (our case): Dermoids are notorious for torsion (15%) because of their long pedicle and (heavy) weight (due to fat).
2. Rupture—spontaneous rupture is rare. Their thick cyst wall resists rupture compared with other ovarian neoplasms. But if it does rupture, it leads to a very serious chemical peritonitis. Peritonitis is attributed to sebum and hair contents of the cyst. Chronic leakage of teratoma contents leads to granulomatous peritonitis that may be interpreted as widespread malignancy.

Figure 6 Gross left and right ovaries.

3. Recurrence 3–4%.
4. Malignancy—rare 1.7% usually squamous cell carcinoma, rarely malignant thyroid tumours.

Diagnosis

Main imaging tool: ultrasonography

Characteristic features of ultrasonography:

- A. Tip of the iceberg—This sign is created by amorphous echogenic interfaces of fat, hair and tissues in focus in the foreground that shadow and thus obscure the structure behind it.
- B. Fatfluid or hair fluid levels—A distinct linear demarcation seen.
- C. Hair—A frequent component of mature cystic teratoma, when intermixed with sebum forms accentuated lines and dots that represent hair in longitudinal and transverse planes.
- D. Rokitansky's protuberance—When two or more ultrasonographic findings are present the predictive value is 100% for dermoid cysts.

Treatment: surgical excision

O'Neill and Cooper^{1–3} reported a case of a 17-year-old woman with a bilateral adnexal mass consistent in appearance with dermoid cyst on a CT after a motor vehicle accident. She underwent exploratory laparotomy (ovarian cystectomy) with histopathology confirming the presence of bilateral ovarian dermoid cyst. Three years later she had recurrent dermoid cyst which was expectantly managed with serial ultrasounds and after 24 months slow but visible growth of the mature cystic teratoma was confirmed.

As per MEDLINE search for comparison between laparoscopic versus open ovarian cystectomy for dermoid cyst, it was concluded that laparoscopic procedure is safe, costeffective with less hospital stay, postoperative pain and analgesic. However, spillage rate of its content is more in laparoscopic procedures particularly with large tumours > 8 cm.

Intraoperative tumour spillage raises the concern of chemical peritonitis and postoperative adhesions.^{4 5}

The challenging aspect of this case was that the patient was a 19-year-old unmarried woman with bilateral mature cystic teratoma of the ovary. The whole of the left ovary was involved in the dermoid cyst without any normal ovarian tissue. The right ovary too had a dermoid cyst in the posterior aspect (3.5×2 cm) but we could do right ovarian cystectomy thereby preserving a significant amount of normal ovarian tissue for menstrual function and future fertility. The incidence of bilateral dermoid cyst of the ovary is 10%. But there are only a few cases in literature of bilateral dermoid cyst of ovary in young individuals less than 21 years (figure 6).

In our case we resorted to laparotomy with a subumbilical vertical right paramedian incision due to the large size (to avoid accidental rupture and subsequent peritonitis) and also because the dermoid cyst was bilateral. The left ovarian dermoid cyst was large (28×19 cm) involving the whole of the left ovary without any normal ovarian tissue and the left fallopian tube was stretched over the dermoid cyst. Therefore left ovariectomy and salpingectomy was performed. The right ovary had a 3.5×2 cm dermoid cyst in the posterior aspect. The anterior aspect had a considerable amount of normal ovarian tissue and therefore right ovarian cystectomy was performed retaining significant amount of normal ovarian stroma for menstrual function and future fertility.^{6 7}

Commerci *et al*,⁸ in their clinical pathological evaluation of 517 cases concluded that there has been an important change over the past 14 years in the management of mature cystic teratomas, with an increased tendency for ovarian preservation.

Learning points

- ▶ A conservative surgical approach is of prime importance in a young patient with an aim to preserve ovarian function and future fertility.
- ▶ Preoperative evaluation of the adnexal mass and the choice of operation techniques are important to reduce intraoperative complications and preserve ovarian tissue.
- ▶ With improved laparoscopic surgical skills and instrumentation, laparoscopic management of dermoid ovarian cyst is now gaining acceptance. But in a large dermoid ovarian cyst, laparotomy is preferred over laparoscopy in order to avoid spillage with subsequent risk of chemical peritonitis and adhesions.
- ▶ Laparotomy provides a three-dimensional vision which increases depth perception. This along with the tactile sense enables the surgeon to retain the maximum amount of normal ovarian tissue particularly in bilateral dermoid ovarian cyst in young patients.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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