

## Can Removal of Dermoid Cyst Increase Expression of AMH?

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### Background

Dermoid cysts are the most common form of all the ovarian teratomas and are usually benign in nature. They are also known as mature cystic teratoma.

Dermoid cysts are mostly seen in young women in their reproductive age usually in second or third decade [1]. They are bilateral in 10% cases [2,3]. These cysts develop from the same cell line as of the oocytes and the mechanism by which these cysts develop is possibly by failure of meiosis II or from a premeiotic cell in which meiosis I has failed [4]. As dermoids are known to be originating from same cell line as oocytes, this case report asks if the presence of dermoid cyst/cysts can affect AMH levels and can cystectomy reverse this effect?

### Case Presentation

A 27 years old woman presented as an urgency with a sudden onset of severe right iliac fossa pain associated with vomiting.

She had a history of regular periods and was medically fit and well except for BMI 37.3kg/m<sup>2</sup>. Acute pelvic pathology was suspected and an emergency ultrasound scan was carried out. Ultrasound scan of pelvis showed a possible right adnexal lesion, however, a CT scan was advised due to difficulty in visualization on ultrasound due to body habitus. CT scan suggested a right sided dermoid cyst of 9x5x4 cm with suspected torsion. Therefore, an emergency laparoscopy was carried out. Intraoperatively, a right ovarian dermoid cyst was found measuring approximately 10 cm in diameter and the ovary was noted to have torqued.

Right ovarian cystectomy was performed. However, the remaining ovarian tissue was noted to be necrotic and fragile resulting in the preservation of very little ovarian tissue.

During the laparoscopy, a left ovarian dermoid cyst was also noted of approximately 6cm in diameter. As the left ovary was unaffected, a cystectomy was not carried out because of concern about a further reduction in ovarian reserve.

Following this acute episode, the patient was referred to the ferti-

lity unit for consideration of fertility preservation.

On referral to the fertility unit three months later, base line investigations were carried out to assess the ovarian reserve. Her Anti Mullerian Hormone (AMH) level was 4.7pmol/L, FSH of 7.9 IU/L, LH 4.4IU/L, and ultrasound (transvaginal) pelvis demonstrated a normal anteverted uterus with left ovarian dermoid of 56x44x65mm and an antral follicle count of 3. Right oophorectomy noted.

In view of her low reserve, fertility preservation in the form of egg freezing was discussed, but there was concern about the responsiveness of the ovary to stimulation given the presence of the dermoid and the concern about rupturing the cyst during oocyte aspiration. There was also concern about the patient's raised BMI of 37.3 kg/m<sup>2</sup>. The patient was therefore advised to try to reduce her weight and plans made for regular scan review. A repeat scan was performed which showed that the left ovarian dermoid had increased to size 70x53x40mm. Due to the increase in size of the dermoid, it was felt that an ovarian cystectomy should be carried out. An elective laparotomy was undertaken with good conservation of the remaining ovarian tissue. The patient was counselled that there may still be a risk of a significant reduction in ovarian reserve.

### Outcome and Follow up

The patient made a good recovery from surgery and arrangements were made for an ovarian reserve assessment at 9 months follow up when the AMH was 16.9 pmol/L. A repeat AMH 9 months later was noted to be 12.9pmol/L, significantly higher than that measured before cystectomy.

### Discussion

Dermoid cysts arise from germ cells and can be unilateral or bilateral. These are the most common form of benign ovarian germ cell tumors. Very rarely there is a risk of malignant transformation 0.2-2% [5,6].

Most dermoids are asymptomatic, however, they can cause pain especially if there is torsion, rupture or bleeding.

Most published data suggest a significant reduction of ovarian reserve after the removal of ovarian cysts [8,9,10]. AMH is produced by pre-antral and small antral follicles, but not primordial follicles and is used as a marker of ovarian reserve [11]. However, in this case, AMH levels were noted to be significantly higher after ovarian cystectomy. It is possible that the presence of a large dermoid cyst could alter normal folliculogenesis and hence affect AMH levels. It is difficult to postulate the cause of this, but may be due to an effect on blood supply or a direct compressive effect affecting the latter stages of folliculogenesis despite the presence of primordial follicles. Should this be the case, removal of cyst could eliminate this direct or indirect suppression and hence increase the expression of AMH by allowing the later stages of folliculogenesis.

Counselling young women with ovarian dermoids is difficult. Many women present after unilateral oophorectomy with a dermoid in the contralateral ovary and present a management dilemma. There are concerns that further ovarian surgery may adversely affect ovarian reserve but these patients also pose difficulties for oocyte preservation. It is standard practice to assess ovarian reserve in these patients to help guide their long term management.

Although this is only a single case, we feel that it raises concern about the interpretation of ovarian reserve markers in the presence of ovarian pathology. More prospective studies are needed to evaluate the effect of dermoid cysts and other ovarian pathology on ovarian performance.

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