



A Challenging Case of Fertility Preservation in Metastatic Struma Ovarii in a 29-Year Old With Successful Delivery

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Abstract

Introduction Struma ovarii is a rare ovarian teratoma characterised by the unusual presence of thyroid tissue. Even though usually benign, malignant transformation is sometimes detected. We report such a case of malignant struma ovarii in a 29-year-old nulliparous woman who was managed systematically with fertility preservation and followed up to have a successful delivery.

Patient Intervention The patient was diagnosed to have bilateral complex ovarian cyst when evaluated for pain abdomen. She underwent bilateral ovarian cystectomy with frozen section biopsy as initial management. On diagnosing as malignant epithelial ovarian tumour in frozen, definitive treatment was planned after final histopathology report and fertility preservation. Her histopathology showed stage 3 malignant struma ovarii. Multidisciplinary team was convened. After further detailed evaluation, she had embryo freezing by controlled ovarian stimulation with antagonist protocol. Two good quality embryos were vitrified on day 2 post-intra-cytoplasmic sperm insemination (ICSI). She underwent staging laparotomy that included uterus conserving surgery with bilateral oophorectomy, omentectomy, peritonectomy, appendicectomy with total thyroidectomy and iodine ablation. After 1 year of follow-up, embryo transfer was done which resulted in a successful delivery. This is, to our knowledge, the first case of fertility preservation after stimulation with gonadotropins in a case of malignant struma ovarii.

Conclusion Poor ovarian reserve due to bilateral ovarian cystectomy, time constraint as she had to undergo a definitive surgery and residual complex ovarian cystic lesions made this a challenging case.

Keywords Struma ovarii · Oncofertility · In vitro fertilisation

Introduction

Struma ovarii is a monodermal variant of ovarian germ cell tumour, predominantly consisting of mature thyroid tissue. They are rare tumours accounting for 0.5–1% of ovarian malignancies and 2–5% of ovarian teratomas. [1] Occurrence of malignancy in struma ovarii is still rarer with incidence less than 5% of cases. [2] Metastasis of malignant struma ovarii is rarer. Sites of metastases can be peritoneum, opposite ovary, lymph nodes, liver, lung, bone and brain. As it is very rare, treatment and follow-up procedures are not clearly defined. They generally present in women aged 40–60 years. Given its rarity and age of occurrence, very few guidelines aid in management of malignant struma ovarii in young women who have not completed their fertility.

We present a case of 29 year of nulliparous diagnosed with metastatic struma ovarii, managed systematically with

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fertility preservation and followed up to have a successful delivery.

Case report

Patient information

A 29-year-old nulliparous woman presented with right-sided lower abdominal pain for two months to gynaecological department in the year 2018. She had no history suggestive of weight loss, loss of appetite or other gastrointestinal symptoms. She had undergone right ovarian cystectomy two years prior for benign endometriotic cyst confirmed by histopathology. The patient was on oral contraceptive pills in this time gap to prevent recurrence of endometriosis. There was no history of malignancy in the family. Her previous medical history was unremarkable.

Her general condition was good. Her per abdominal examination revealed mobile hard mass palpable in right iliac fossa, non-tender in nature.

Diagnostic assessment

Her tumour markers revealed CA 125: 86U/ml. Ultrasound scan showed a bilateral ovarian tumour of size 7.6×6×3.6 cm on the right side and 5.8×5×3.8 cm on the left side. Magnetic resonance imaging of abdomen and pelvis showed a bilateral complex solid cystic ovarian mass of the same size, solid enhancing nodules with irregular thick septae. Other organs were reported as normal. Based on the age of the patient, previous history and imaging diagnosis, differential diagnosis of primary ovarian malignancy or atypical endometriosis was suggested.

Therapeutic Intervention

The patient was posted for open bilateral ovarian cystectomy. Intraoperatively findings noted were—bilateral ovarian cysts of 6×7 cm on the right and 5×4 cm on the left side with irregular surfaces. Multiple nodular peritoneal and omental deposits were noted (Fig. 1). Uterus appeared normal.

Bilateral ovarian cystectomy was done with infracolic omentectomy and sent for frozen section, which was reported as bilateral malignant epithelial ovarian tumour with similar lesions in the omentum. Patient was planned for definitive treatment after a detailed histopathology report.

The histopathology revealed diagnosis of struma ovarii with multiple peritoneal deposits, consistent with highly differentiated follicular carcinoma (Fig. 2). The cells were positive for thyroid transcription factor 1 and thyroglobulin. The patient

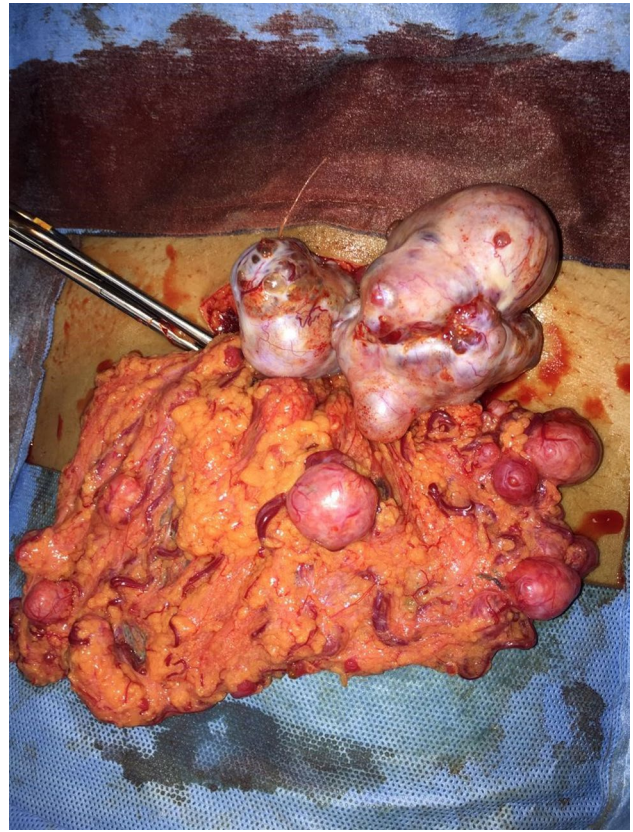


Fig. 1 Intraoperative image of bilateral ovarian cysts with irregular surfaces and multiple nodular omental deposits

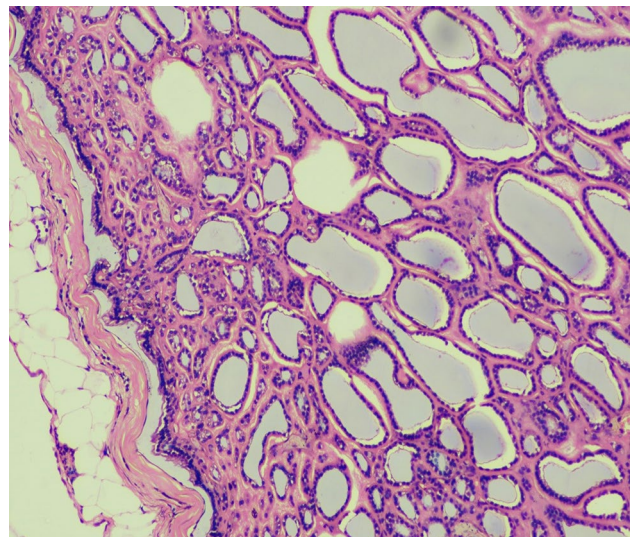


Fig. 2 Histopathology showing multiple colloid filled follicles lined by flattened cuboidal cells. Foci of papillary hyperplasia and haemorrhage seen, consistent with highly differentiated follicular carcinoma. Cells positive for TTF1(nuclear) and thyroglobulin (cytoplasmic)

was diagnosed as International Federation of Gynaecology and Obstetrics stage 3 metastatic malignant struma ovarii.

Due to rarity of the scenario, the treatment and follow-up for this patient were not clearly defined. She underwent further evaluations including ultrasound neck which was normal study. Her tumour markers, T3, T4 levels were within the normal range, and TSH was 0.006 mIU/l. Her case was discussed in the multidisciplinary tumour board, and a decision was taken to proceed with staging laparotomy with bilateral oophorectomy and total thyroidectomy, followed by a radio iodine ablation. As she was married for 1 year and was nulliparous, the couple were counselled regarding fertility preservation options. She and her husband agreed for embryo freezing. Her antiMullerian hormone value was 1.2 ng/ml. The obstacles we faced were the poor ovarian reserve due to bilateral ovarian cystectomy and the time constraint as she had to undergo a definitive surgery as early as possible. Also the ovaries had residual complex cystic lesions.

She had controlled ovarian stimulation with Antagonist Protocol-Recombinant FSH 225units for 9 days followed by trigger with recombinant HCG. Three mature oocytes were retrieved. Intracytoplasmic sperm injection (ICSI) was done, and 2 embryos were vitrified on day 2.

After 1 week, she underwent staging laparotomy with total thyroidectomy. Bilateral salphingo-ovariotomy with omentectomy, pelvic peritonectomy and appendectomy were done with preservation of uterus. I 131 scan after surgery showed uptake in residual thyroid tissue and in peritoneum and bowel surface. Thus, she underwent iodine ablation. I 131 scan was repeated after 6 months which showed no abnormal uptake. After 1 year of ablation and clearance from the oncology team, she was put on hormone replacement therapy (HRT) with oestrogen and progesterone for 6 months as the uterus was atrophic. After stopping HRT endometrial preparation for frozen embryo transfer was done using estradiol valerate. Two embryos- 9 cell grade 2 and 8 cell grade 2 were transferred on first august 2020. She had a positive pregnancy test with Beta HCG: 689 on 17.8.2020 and clinical pregnancy was confirmed after 2 weeks. She received luteal support till 12 weeks and had an uneventful antenatal period. She delivered a term healthy girl baby weighing 3.1 kg by elective caesarean section at 38 weeks in April 2021. Her postpartum review after 6 weeks was normal. She is being followed up in nuclear medicine and endocrinology.

Discussion

Malignant struma ovarii is a rare ovarian tumour. It is frequently related to follicular variants of papillary thyroid carcinoma (54%) as in our case and papillary thyroid carcinoma (21%). [2].

The age of the patient, desire for fertility, size of the tumour, histopathology and staging have to be taken into account during formulation of management plan. Review article by Shrimali RK et al. recommends unilateral adnexectomy for unilateral struma ovarii in the reproductive age group and total hysterectomy with bilateral salping-oophorectomy for bilateral tumours and in postmenopausal women. Also, thyroidectomy, radioiodine ablation and suppressive thyroid-stimulating hormone treatment form part of adjuvant therapy which still remains controversial. [3].

A case series by Kraemer et al. reviewed 1-year follow-up of seven patients who underwent conservative treatment, such as tumour resection or unilateral salpingo-oophorectomy, for malignant struma ovarii, and there were no patients with a subsequent pregnancy. [4] In 2018, Iwahashi et al. reported a case of 30-year-old multiparous woman who delivered 2 years after fertility-sparing surgery for papillary thyroid carcinoma arising from mature ovarian cystic teratoma, but by spontaneous conception. [5] Recently, in 2019, Kirim Hong et al. demonstrated successful delivery using IVF, in a similar patient profile. In both these cases, malignancy was in early stage involving one ovary alone. IVF was done after complete cure of the disease. [6] But in our case as both ovaries were involved, and as it was a stage 3 disease, we had to proceed with controlled ovarian stimulation, while there was active disease. The challenges we faced were due to poor ovarian reserve and the presence of complex cystic lesions in the ovary. Our case describes systematic approach of fertility-sparing surgery for malignant struma ovarii followed by adjuvant therapy with successful IVF delivery. Patient, who otherwise would have to go for donor oocytes, is able to conceive with her own embryos because of timely decision and multidisciplinary involvement. This is, to our knowledge, the first case of fertility preservation after stimulation with gonadotropins in an active case of malignant struma ovarii.

There was no literature available on fertility preservation before a radical surgery in a case of malignant struma ovarii. Also, response of ovaries to controlled ovarian stimulation and embryo quality could not be predicted, as the amount of healthy ovarian tissue in this patient was not known due to previous history of endometriosis and cystectomy. Concerns regarding the possible effect on the thyroid hormone status with the use of ovarian stimulating drugs were also a concern. Counselling the couple regarding the possible risks of waiting for the ovarian stimulation, possibility of cycle cancellation, chance of poor fertilisation and implantation failure were difficult.

Conclusion

In spite of advances in diagnosis and treatment of cancers leading to high cure rate, survivors of ovarian malignancy face problems related to infertility or early menopause.

Our case demonstrates that the possibility of infertility has to be evaluated and addressed before the start of the treatment of such patients, involving the fertility specialists at the right time. Whole range of fertility preservation options has to be discussed with the patients along with spouse, so that they make an informed decision. We could achieve a successful outcome in a case of oncofertility because of the excellent teamwork.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Publication of the case report “**A challenging case of fertility preservation in metastatic struma ovary in a 29-year-old with successful delivery**” with pictures does not require approval from the institutional ethics committee as the treatment has not deviated from the standard protocol.

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About the Author



Dr. Shameema Anvar Sadath A Gynaecologist with more than 16 years of experience, Dr. Shameema Anvarsadath is an expert in infertility management. She has been in the field of reproductive medicine from the year 2006 and has worked with internationally renowned IVF experts during her tenure with the Ministry of Health, Kuwait - the only facility of its kind in the country. Dr. Shameema is also a highly skilled laparoscopic and robotic surgeon, with expertise in complex fertility-preserving procedures like myomectomies, endometriosis surgeries as well as hysterectomies. She has presented many papers in national and international conferences. She has esteemed degree of FRCOG from Royal College of Obstetrics and Gynaecology, United Kingdom. At present she is working as senior consultant in Aster medicity, Kochi, Kerala.

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