

## Management of a Giant Border-line Malignant Mucinous Tumor of the Ovary in an Infertile Woman

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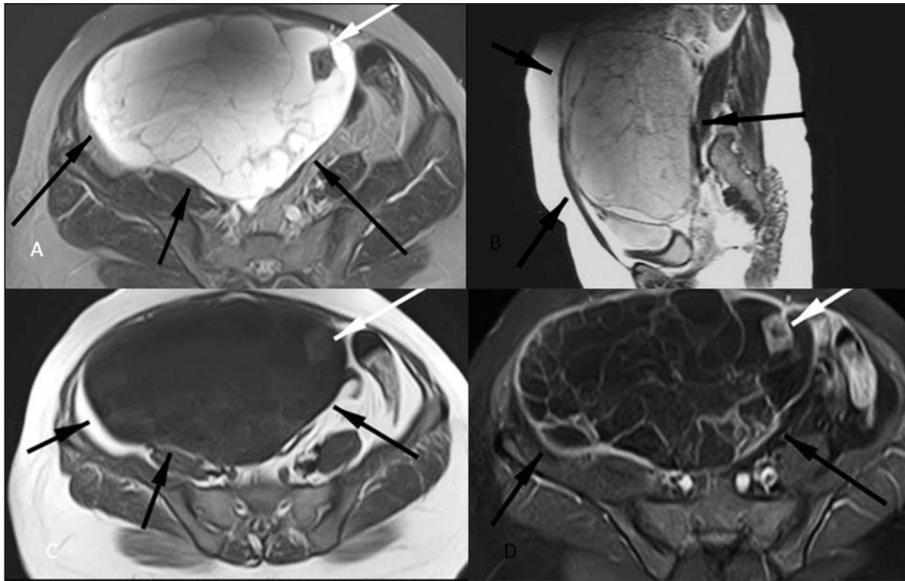
**ABSTRACT** Mucinous tumors account for 12-15% of all ovarian tumors and nearly 10% of them are borderline (atypical proliferative) types. We describe the case of a 37-year-old infertile woman who was diagnosed as border-line mucinous tumor oriented from the right ovary at the 6th years of her infertility process. The relationship between borderline ovarian tumors (BOT) and infertility draws attention in recent years. The increased risk of BOTs in infertile patients is thought to be associated with infertility treatment. The overall prognosis of BOTs is good. Conservative surgery recommends in addition to complete staging in such young and especially infertile patients.

**Keywords** Ovarian neoplasms; infertility, female; neoplasms, cystic, mucinous, and serous

Mucinous tumors account for 12-15% of all ovarian tumors.<sup>1</sup> Although the vast majority of these tumors are benign (75%), borderline (atypical proliferative) types (10%) and carcinomas (15%) are also seen. It was thought that mucinous carcinomas of the ovary may develop from benign and mucinous borderline tumors.<sup>2</sup> Mucinous borderline ovarian tumors (BOTs) are classified as gastrointestinal type (85%) and seromucinous type (15%), depending on their histological architecture and type of tumor cells. Seromucinous ovarian tumors are not common and their clinical behavior is not as aggressive as much as other types. The reported mortality rate with these tumors is low.<sup>2</sup> There is slightly increased relationship between infertility and BOTs.<sup>3,4</sup>

### CASE REPORT

We presented a case of a 37-year-old woman who had been undergoing infertility treatment for 6 years. Diagnostic laparoscopy performed for infertility two years earlier had revealed a normal looking uterus and a normal looking left ovary. A cyst on the right ovary containing serous fluid was aspirated during the procedure. The patient had undergone a second ovulation induction protocol for primary infertility 6 months earlier. She presented to our hospital with an abdominal mass running into the diaphragm. Ultrasonographic and magnetic resonance imaging investigations showed a 28×30 cm cystic mass with septations, possibly oriented from the right ovary and filling the abdominal cavity, free fluid in the pelvic and perihepatic sides, and no



**FIGURE 1:** The magnetic resonance imaging image of the right ovarian cystic mass in different sections. Black arrows show the cyst, white arrows show the intramural nodule.

pathological lymphadenopathia (Figure 1). Endoscopic and colonoscopic investigations were normal. Endometrial sampling revealed an early proliferative phase endometrium. Laboratory analysis showed a normal hemocount, elevated Ca-125 (488 U/ml, normal range 0-35), elevated fibrinogen (510 mg/dl, normal range 200-400), and sedimentation (89 mm/h, normal range 0-20). Laparotomy with a mid-line incision was performed, and the giant abdominal mass, which was oriented from the right ovary to the diaphragmatic space, was excised by oophorectomy. The result of the intraoperative and end-pathological investigation was an atypical proliferative mucinous tumor (seromucinous type). Omentectomy and appendectomy materials were nonmalignant. Preoperative abdominal washing fluid was benign. There was no recurrence in the first 10-month follow-up.

## DISCUSSION

The overall prognosis with BOTs is good. They are generally seen in young ages, and they comprise about 15-20% of all epithelial malignancies. Higher infertility rates have been reported in patients with BOTs. An increased incidence of BOTs in ovarian malignant tumors has been observed in recent decades worldwide, together

with a slightly decreasing incidence of ovarian cancer.<sup>3</sup> This trend may reflect more accurate pathological diagnosis of BOTs and/or a potential change in the risk factors contributing to the development of BOTs.

Infertility is frequently observed in patients with BOTs, with up to 35% of patients having a history of infertility before treatment.<sup>4</sup> One-third of patients diagnosed with BOTs are younger than 40 years and frequently are candidates for fertility-sparing surgery.<sup>5</sup> The increased risk of BOTs is thought to be associated with infertility treatment.<sup>6</sup> Further studies are needed to investigate the relationship between infertility treatment and ovarian tumor development.

The prognosis of BOTs is generally excellent. After conservative surgery, the median number of relapses in most series was nearly 15%, compared to 5% in cases of radical surgery.<sup>7</sup> This recurrence rate was reported to be higher after cystectomy (12-58%) than after oophorectomy (0-20%).<sup>8</sup> Although there was a higher recurrence of BOTs after conservative surgery, the survival time of patients who underwent such surgery was not shortened.<sup>9</sup> Wong et al. reported a retrospective analysis of 247 borderline ovarian tumor patients (68% of the cases were mucinous type) and recurrence rate for pa-

tients who underwent a primary pelvic clearance was reported as 1.6% compared to fertility-sparing conservative surgery (3.3%; although  $P=0.683$ ). There was no significant difference was noted in recurrence and mortality between staged versus unstaged procedures and the overall survival rate was reported as 98.0%.<sup>10</sup> Performing unilateral oophorectomy rather than cystectomy when the contralateral ovary is present and in normal appearance reasonable to avoid recurrence and still maintain fertility. In this case, conservative surgery was chosen because of the infertility of the patient. Unilateral oophorectomy was performed because of the huge size of the cyst and the lack of any normal ovarian tissue.

To establish a complete FIGO staging, an intraoperative exploration of the entire abdominal cavity should be conducted, together with peritoneal washing, omentectomy, multiple peritoneal biopsies, and complete resection of all macroscopic suspected lesions.<sup>11</sup> The FIGO staging procedure was performed in our patient and revealed no pathological findings.

Follow-up is essential using routine ultrasound imaging, paying special attention to the remaining ovary in conservatively treated patients.<sup>11</sup> The re-

ported rate of pregnancy in BOTs treated with conservative surgery varies between 32 and 65%.<sup>12</sup>

In conclusion, it is important to make a detailed examination of ovarian cysts to ensure that any potential malignancy is not overlooked in young patients who wish to retain their fertility.

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#### 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:** Semra Oruç Koltan; **Design:** Pınar Solmaz Hasdemir; **Control/Supervision:** Tevfik Güvenal; **Data Collection and/or Processing:** Pınar Solmaz Hasdemir; **Analysis and/or Interpretation:** Semra Oruç Koltan; **Literature Review:** Pınar Solmaz Hasdemir; **Writing the Article:** Pınar Solmaz Hasdemir; **Critical Review:** Semra Oruç Koltan.

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