

Aggressive ovarian plasmacytoma resistant to radiation and chemotherapy

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We present a case of ovarian plasmacytoma results in the patient's death by very quick progression after the operation, radiation and chemo therapy. As reported cases of primary ovarian plasmacytoma are very rare, its prognosis remains unknown. To date, we found seven reports of solitary ovarian plasmacytoma. Except for our case, most cases showed relatively slow progression or need only strict observation without recurrence. Although post-surgical therapy of ovarian plasmacytoma is not clearly established, our case was needed to use radiation and chemo therapy against the very rapid recurrent tumor. In this case, ovarian plasmacytoma relapsed very quickly, suggesting that some cases of ovarian plasmacytoma may require an aggressive adjuvant therapy.

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Introduction

Extramedullary plasmacytomas (EMPs) account for only 3% of all plasma cell neoplasms¹. They most commonly arise from the mucous membrane of the upper respiratory tract². Primary plasmacytomas of the ovary are very rare, with only seven reports in the literature. Emery et al. reviewed these and found that there was little experience on post-surgical therapy with primary ovarian plasmacytomas³. We present here a case of an ovarian EMP resulting in disseminated recurrence in a very short time, despite radiochemotherapy after surgical resection.

Case report

A 65-year-old Japanese woman visited her doctor complaining of abdominal distention. A pelvic examination, ultrasound and computed tomography (CT) scan revealed a large pelvic mass. The patient was referred to the Department

of Obstetrics and Gynecology at Nagasaki University hospital with a suspected ovarian tumor. She complained of right lower abdominal pain. A 10-cm diameter, smooth-surfaced and elastic hard mass was palpable through the anterior fornix. Preoperative chest X-rays were normal, an esophagogastroduodenoscopy only showed an atrophic gastritis and a colonoscopy gave normal results. A magnetic resonance imaging (MRI) scan of the pelvis revealed ascites and an irregular ovary: half polycystic and half a solid mass measuring 10 × 7 × 9 cm (Figure.1). Abdominal CT scanning showed the solid part of the mass to be enhanced and no enlarged lymph nodes. Blood tests showed that the white blood cell count was 6,400/mm³ with 64% neutrophils, 28% lymphocytes, 7% monocytes, 1% eosinophils and 1% basophils. Hemoglobin on the referred day was 10.0 g/100 mL. The preoperative serum cancer antigen (CA)-125 level was 97.3 U/mL.

A malignant ovarian cancer was diagnosed and a total abdominal hysterectomy, bilateral salpingo-oophorectomy and biopsy of the greater omentum were performed. The

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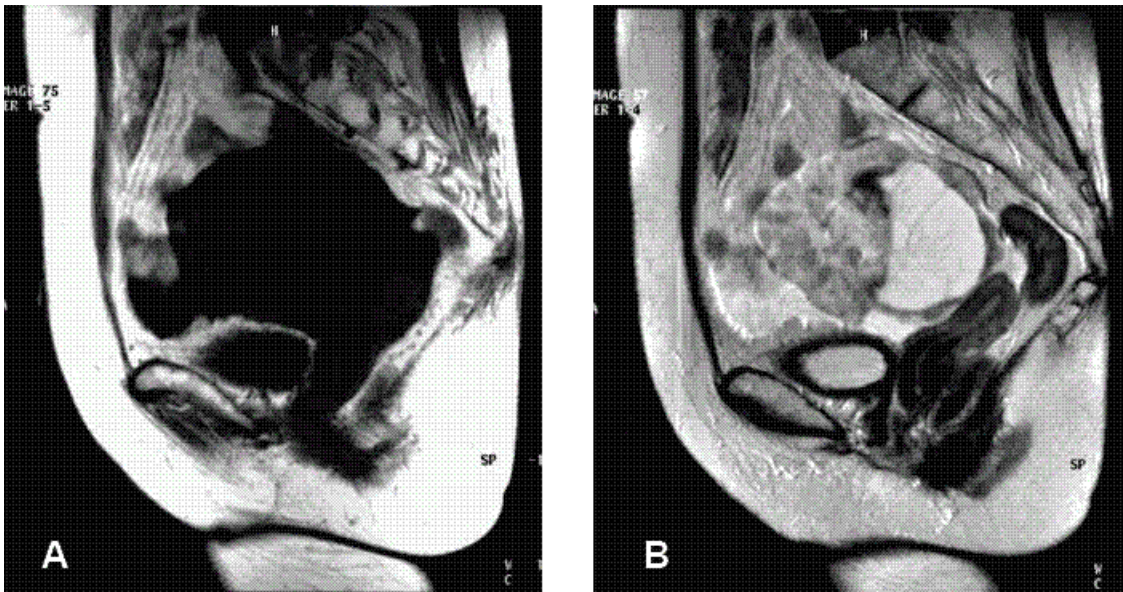


Figure 1. A 65-year-old woman with a large pelvic mass diagnosed as an ovarian plasmacytoma. Preoperative sagittal T1- weighted (A) and sagittal T2-weighted (B) magnetic resonance imaging (MRI) scan of the pelvis. There was ascites and an irregularly shaped ovary: half polycystic and half comprising a solid mass measuring 10 × 7 × 9 cm.

large mass originated from the right ovary and had firm adhesions with the sigmoid colon and rectum. The tumor could not be totally resected because of cancerous adhesions, and there was a residual tumor measuring 3 × 3 cm on the serosa of the sigmoid colon. The resected specimen consisted of a solid tumor measuring 10 × 8 × 8 cm. The tumor was partly smooth-surfaced and partly covered by adhesions. The cut surface was yellow and lobulated. Cysts were present in half of the tumor with pus-like yellowish fluid. Histopathology showed sheets of atypical round cells with faint acidophilic to basophilic cytoplasm (Figure.2). Immunohistochemistry showed the cells to be positive for plasmacyte marker, IgCD10, CD56, κ -immunoglobulin light chains and IgG, but negative for PLAP, AE1/AE3, AFP, CD3, CD57, CD15 and other tumor markers. No malignancy was detected in the biopsy sample of the omentum.

Although there was the possibility of a metastatic ovarian plasmacytoma arising from bone marrow, a bone scintigram was negative and the bone marrow biopsy showed no abnormal cells. Monoclonal paraprotein was not detected and the tumor was diagnosed as a primary plasmacytoma of the ovary. At the 2nd week after operation, the patient continued to complain of abdominal distension and an MRI scan showed that the tumor was still growing with multiple metastatic nodules in her pelvis despite the original resection (Figure.3). Therefore, radiation therapy was administered after constructing a colostomy, which was not affected by radiation. Radiotherapy for whole pelvis and para-aorta was

planned to be administered at a dose of 30.0 Gy in 20 fractions in the each field. However, the tumor continued to grow during the therapy. The radiation therapy was suspended at the 15th fraction of the total 20 planned fractions. Then, chemotherapy with Paclitaxel (80mg/m²/every week) and Carboplatin (AUC5/every 3weeks) was administered from the 4th week after surgery. The tumor continued to proliferate and the patient died of multiorgan failure at 2.5 months after the first operation.

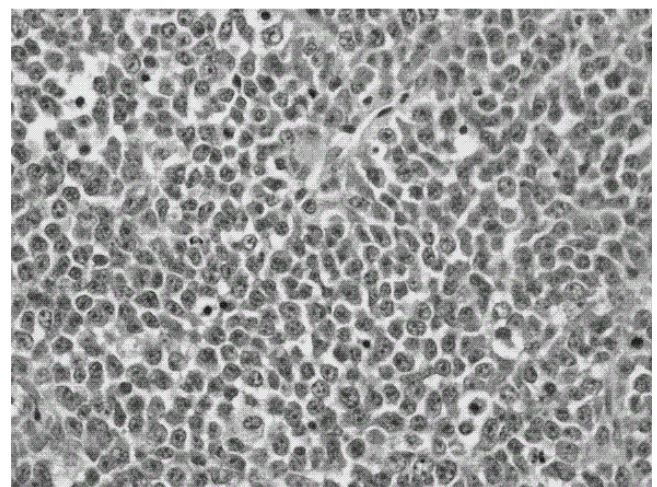


Figure 2. Histopathology showed a diffuse proliferation of atypical large lymphoid cells with round or oval nuclei, small nucleoli and abundant cytoplasm. Mitotic figures were frequent (hematoxylin and eosin staining; × 400 magnification).

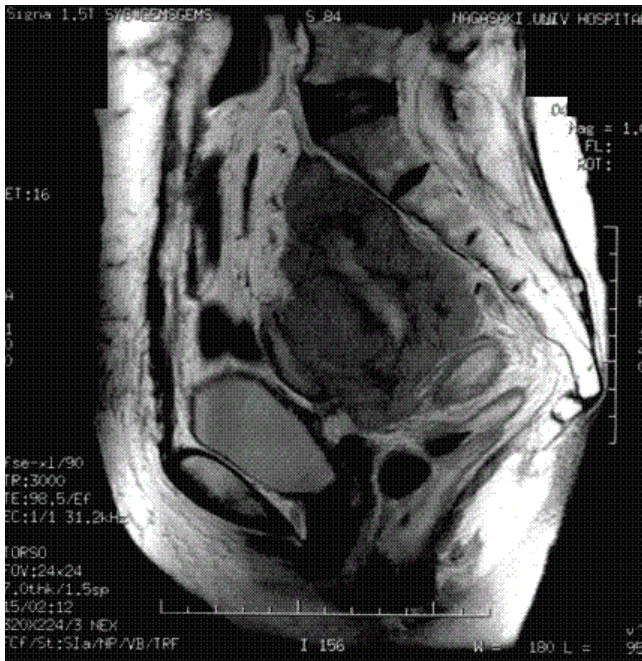


Figure 3. A sagittal T2-weighted MRI image of the pelvis, 14 days after a total abdominal hysterectomy and bilateral salpingo-oophorectomy. At this point the tumor measured $11 \times 7 \times 7$ cm.

Discussion

EMPs are rare neoplasms and 80-90% have been reported as developing in the head or neck. Their diagnostic criteria are: diagnosis of a plasma cell tumor proven by pathology, absence of bone or other tissue involvement, bone marrow biopsies showing plasma cell infiltration not exceeding 5% of all nucleated cells and a low concentration of M-protein¹. Our case satisfied all of these criteria together with immunohistochemistry results and was diagnosed as a primary ovarian plasmacytoma. Emery *et al.* reviewed the seven reported cases using the guidelines of International Federation of Gynecology and Obstetrics (FIGO), but excluded one from 1938³. All reported tumors were large and most were over 12 cm in size except for one that was reported as "fist-sized" in 1938. The tumor in our case was also large, but it was detected before it grew over 12 cm in diameter. Four previous cases involved only the left ovary; one patient had bilateral ovarian tumors and the laterality of the other two cases is unknown. Here the tumor arose from the right ovary. Emery *et al.* reported that five patients had FIGO stage I disease and one patient with stage III disease died 3 months after surgery. Four patients with stage I tumors were followed for 9-24 months while one patient with a stage I tumor was lost to follow-up. Although there are no

clear guidelines for treating EMPs, radiotherapy is effective for localized tumors⁴. The median overall survival or recurrence-free survival for patients with radiation-treated EMPs was 150 months. EMPs in areas outside the upper aerodigestive tract were resected by surgery in 55.6% of cases, treated by radiation in 11.1% and treated combined by surgery and radiation in 19.8%. In 64.7% of these cases there was no recurrence⁵. Our patient had a FIGO stage IIc tumor that showed very rapid recurrence plus resistance to radiation therapy; this has not been reported before. The tumor in our case and the stage III tumor reported by Bambirra *et al.*⁶ could not be resected successfully and both patients died around 3 months after surgery. It is difficult to recommend a therapeutic strategy for primary ovarian plasmacytomas based on these very few cases. Regarding the initial management of ovarian cancer, complete resection or maximum debulking surgery is recommended as much as possible. Subsequently, adjuvant therapy is performed in most cases except stage Ia ovarian cancer patients. Therefore, a biopsy gives us much important information for adjuvant therapy, because which kind of chemotherapies and/or radiation therapies should be selected as adjuvant therapy depends on the type of pathological findings. However, our case of ovarian plasmacytoma relapsed very quickly despite a maximum debulking surgery followed radiochemotherapy, suggesting that some cases of ovarian plasmacytoma may require an aggressive adjuvant therapy. Also, there is a possibility that aggressive surgery causes a disseminated relapse of ovarian plasmacytoma. Therefore, it may be very useful to estimate which is aggressive ovarian plasmacytoma without a biopsy. Further work isolating another diagnostic tools such as a tumor-specific molecular marker, e.g. DNA, mRNA or microRNA, in plasma will be key to a better understanding of how ovarian plasmacytoma should be manage.

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References

- [1] Nolan KD, Mone MC, Nelson EW. Plasma cell neoplasms. Review of disease progression and report of a new variant. *Surg Oncol.* 2005; 14(2): 85-90.

- [2] Wiltshaw E. The natural history of extramedullary plasmacytoma and its relation to solitary myeloma of bone and myelomatosis. *Medicine (Baltimore)*. 1976; 55(3): 217-38.
- [3] Emery JD, Kennedy AW, Tubbs RR, Castellani WJ, Hussein MA. Plasmacytoma of the ovary: a case report and literature review. *Gynecol Oncol*. 1999; 73(1): 151-4.
- [4] Mayr NA, Wen BC, Hussey DH, et al. The role of radiation therapy in the treatment of solitary plasmacytomas. *Radiother Oncol*. 1990; 17(4): 293-303.
- [5] Alexiou C, Kau RJ, Dietzfelbinger H, et al. Extramedullary plasmacytoma: tumor occurrence and therapeutic concepts. *Cancer*. 1999; 85(11): 2305-14.
- [6] Bambirra EA, Miranda D, Magalhaes GM. Plasma cell myeloma simulating Krukenberg's tumor. *South Med J*. 1982; 75(4): 511-2.