Received: 17 September 2021 | Revised: 18 April 2022 | Accepted: 22 April 2022

DOI: 10.1002/ccr3.5803

CASE REPORT

Clinical Case Reports Open Access WILEY

Growing teratoma syndrome: Two case reports

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Abstract

We present two cases of 10 and 27 years old girls with recurrence of immature teratoma after an incomplete surgical staging. In both cases, there were huge abdominopelvic masses despite decrease in tumor markers with chemotherapy. Complete surgical resection of these masses was done, and histopathology showed only mature teratoma.

KEYWORDS

chemotherapy retroconversion, growing teratoma syndrome, ovarian germ cell tumor

1 | INTRODUCTION

Growing teratoma syndrome (GTS) of the ovary is a rare entity encountered with ovarian germ cell tumor in young girls where there is subsequent growth of a benign tumor, following the removal of the primary malignant tumor during or after chemotherapy. Its exact incidence is not known, but few large series reported an overall incidence of 17.8%.[1–3] However, it is not uncommon in males with testicular malignant non-seminomatous germ cell tumors.[4,5] Logothetis et al. have developed three criteria to call GTS (1) normalization or near normalization of serum tumor markers, (2) increase or persistent of metastatic masses despite appropriate chemotherapy, and (3) the histopathological specimen shows the only mature component of teratoma.[6] This GTS is also named retro chemotherapeutic conversion and was probably the same entity.[7] Here, we report two similar cases of GTS with primary ovarian immature teratoma to add more information regarding this rare disease.

2 | CASE 1

A 10-year-old female child had undergone left ovarian cystectomy without proper surgical staging for Grade-2 immature teratoma ovary of 20 × 18 cm at a local hospital. No tumor markers were done before surgery, and she was not advised for any adjuvant chemotherapy. Eight months later, she presented in our hospital with a recurrence of huge abdominopelvic masses. (Figure 1A) A computerized tomography (CT) scan revealed multiple large abdominopelvic mass 12.8 × 6.3 cm; 9.6 × 6.9 cm; 7.4 × 5.1 cm prehepatic mass, large septated 14.6 × 12.5 cm mass seen in between right dome of the diaphragm and superior surface of the liver(Figure 1B). Her serum marker were elevated—Alpha-fetoprotein (AFP): 3700 ng/ml, CA 125: 181.6 μ/ml. She received three cycles of chemotherapy: Bleomycin, Etoposide, Cisplatin, and Cyclophosphamide. Her AFP level slowly decreased to 178.2 ng/ml with chemotherapy, but no change was seen in tumor masses size. With the diagnosis of growing teratoma syndrome, laparotomy with left ovariotomy and complete excision of abdominopelvic mass including suprahepatic mass with preservation of the normal-looking small uterus and right tube and ovary was done (Figure 2A). During surgery, transection of the left ureter occurred, primarily repaired with insertion of D–J stent for 6 weeks. The postoperative period was uneventful, and she was discharged on the 6th postoperative day. Final histopathological examination of the specimen showed only a mature component of the teratomatous element (Figure 2B). She received three more cycles of chemotherapy of the same regimen. After two and half years, at the age of 12 years, she had her normal menstrual cycle. Currently, she is on regular follow-up and in a disease-free state until this report, which is 5 years and 4 months after the second operation.

3 | CASE 2

A 27-year-old female patient, parity 1, had previously undergone ovarian cystectomy for immature teratoma without proper surgical staging and adjuvant chemotherapy at a local hospital with no grading and AFP level available. She underwent second surgery with a total abdominal hysterectomy and bilateral salpingo-oophorectomy with omental biopsy for relapse of grade 3 immature teratoma with AFP: 422 ng/ml in the same hospital after 10 months. Post-surgery, she received multiple lines of adjuvant chemotherapy there including; 3 cycles of Etoposide and Cisplatin; 2 cycles of Paclitaxel, Ifosphamide, and Cisplatin; three cycles of Gemcitabine and Carboplatin over 10 months. Despite all the treatment due to the progressive increment of tumor mass, she was referred to our hospital. A Magnetic Resonance Imaging (MRI) revealed a giant abdominopelvic mass of 18 × 17 cm compressing bladder; 6.5 × 6.3 cm mass right paracentral anterior abdominal wall involving right rectus abdominal muscles; 15.7 × 10.7 cm right subcapsular region of the liver (Figure 3A,B). Her serum markers were CA125: 150.3 μ/ml, CA 19.9: 709.68 μ/ml, AFP: 2 /ml. She then underwent a third laparotomy at our center with complete excision of pelvic mass, appendectomy, total omentectomy, suprahepatic liver mass resection, and pelvic and lateral parietal peritonectomy (Figure 4A). At the time of dissection of tumor from sigmoid colon, small perforation occurred, which was primarily repaired in two layers in

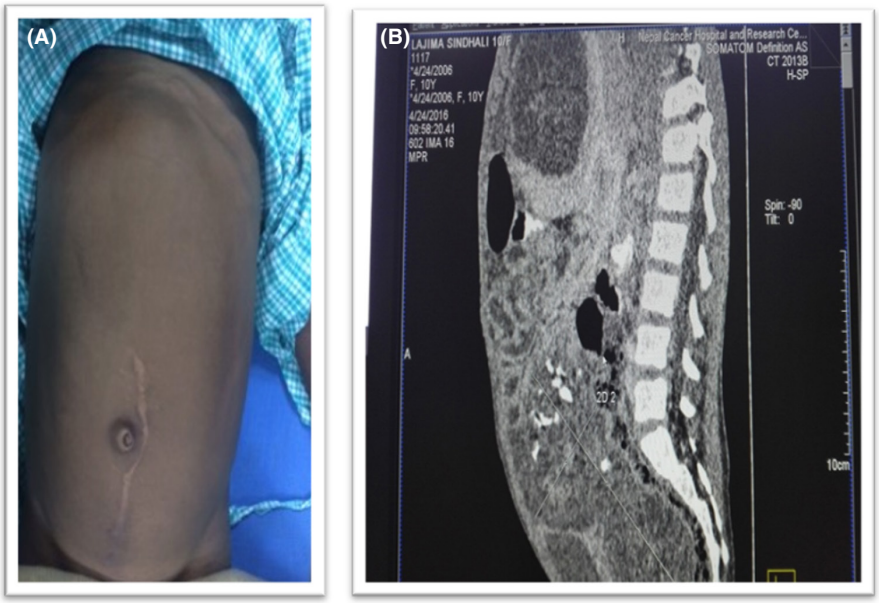

FIGURE 1 (A) Clinical photograph of abdomen showing huge abdominopelvic mass; (B) CT Scan shows multiple intraperitoneal masses

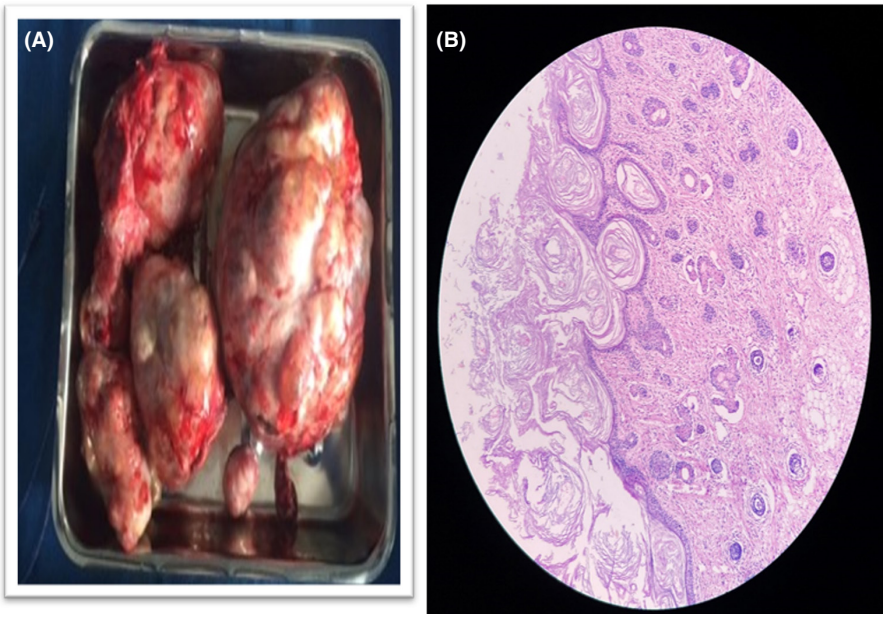

FIGURE 2 (A) Gross picture of multiple intraperitoneal deposits; (B) Microscopic photomicrograph showing a mature component of the teratomatous element

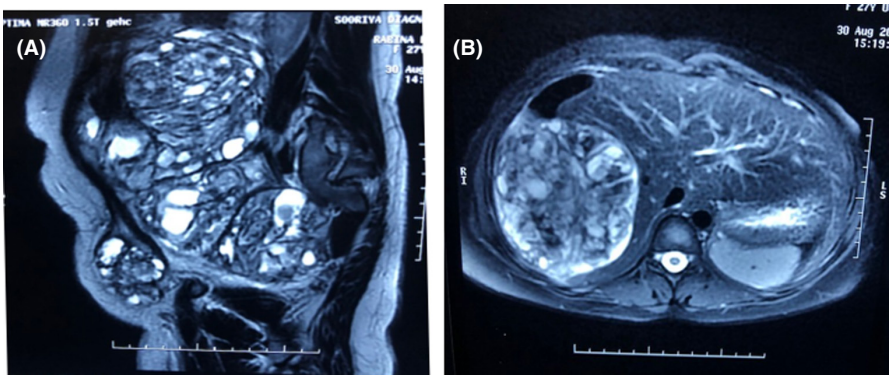

FIGURE 3 (A and B) Magnetic resonance imaging (MRI) revealing giant abdominopelvic mass and suprahepatic mass

the same setting. Her postoperative period was uneventful, and she was discharged on ten postoperative days. Final histopathological examination showed only mature teratoma (including gliomatosis and keratinous cysts) without viable germ cells (Figure 4B). Post-surgery, she received three more cycles of chemotherapy: Vincristine, Dactinomycin, and Cyclophosphamide (VAC regime). A small 6 × 6 cm extraperitoneal suprapubic mass was noted after 3rd cycle of chemotherapy, which was resected out and showed only mature teratoma in histopathology. The patient remains in disease-free condition until this report, which is 9 months after the last operation.

4 | DISCUSSION

Even though the etiopathogenesis of GTS is debatable, most two hypothesis that widely accepted are: immature component of malignant cells are cured with chemotherapy, but mature benign teratomatous elements are resistant and remain same; totipotent malignant germ cell is transformed toward benign mature teratoma due to alteration of the cell kinetics by chemotherapy.[8,9]

Most of the time, immature teratoma presents in a younger patient, the youngest age being reported as 5 years old, where patients usually had unilateral salpingo-oophorectomy only for fertility preservation.[10] Different cases reported that GTS had developed from 3 months to even 8 years later, usually after incomplete surgical staging.[11–13] The possible mechanism of this may be due to micrometastasis of immature teratoma cells within the peritoneal cavity. Both of our patients developed recurrent masses within a few months after an incomplete surgical staging.

GTS can grow rapidly even during the chemotherapy period, may cause pressure effects on great vessels, ureter, and bowel, leading to venous thrombosis, hydronephrosis, bowel obstruction, and fistula formation but mostly concise intraperitoneally.[14] Even our patients had left ureter encasement by the tumor in the first case and sigmoid serosal involvement in the second case. Since these tumors are resistant to chemotherapy and radiotherapy, surgery

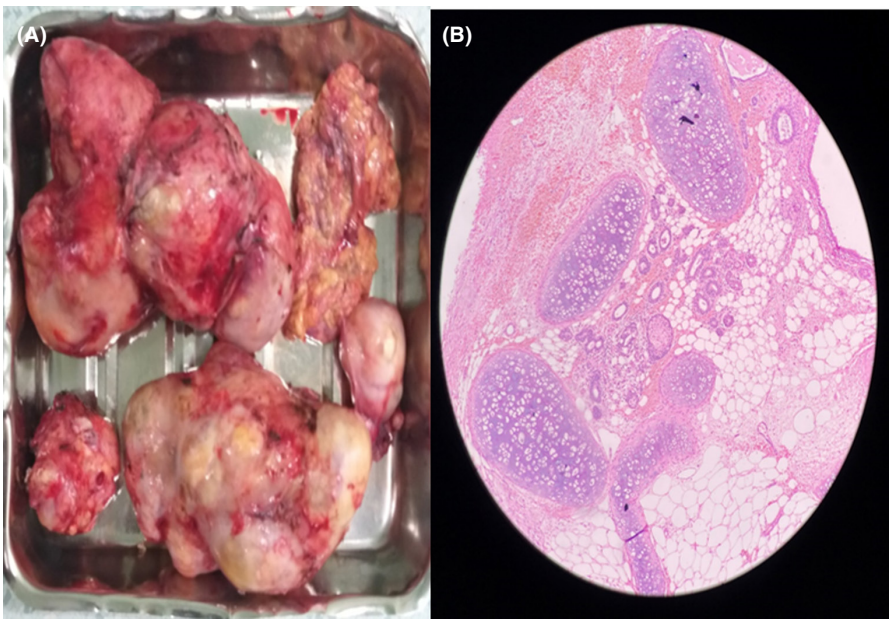

FIGURE 4 (A) Gross picture of multiple intraperitoneal deposits; (B) Microscopic photomicrograph showing a mature component of the teratomatous element

remains a gold standard treatment. Complete surgical excision is feasible even in large tumor masses and in recurrence settings also. In both patients, we were able to excise masses completely without much morbidity and even preserve the fertility in the first case. However, mortality and morbidity depend upon the decision of the timing of surgery. An early decision regarding total resection of masses can decrease morbidity and preserve the patient's fertility. Most of the time, mortality related to GTS is due to postoperative complications and poor patient's general condition.[8]

GTS of the ovary has an excellent prognosis with reported 5-year overall survival of up to 89%–90% who had a complete surgical resection.[14,15] However, regular follow-up is essential, as recurrence has been reported even after 10 years and after complete resection.[12,14,16]

In the case of ovarian immature teratoma, there is no consensus on the need for adjuvant chemotherapy. The grade is the most important risk factor for ovarian immature teratoma relapse across all age groups, according to a risk factors analysis. More relapses of ovarian immature teratoma are seen with grade 3, stage III/IV tumors.[17] Thus, postoperative chemotherapy or radiation therapy has been used after GTS resection in a few reported cases even though there is no clear-cut evidence that it decreases the relapse risk.[2,9]

Even after a seemingly thorough resection of the GTS, our patients had recurrence once in the first case and twice in the second case. This could be due to microscopic residual lesions. Moreover, in both cases, even after we operated, postoperative radiology (ultrasound and CT-scan whole abdomen) showed some suspicious residual/relapsed lesion. Hence, our tumor board decided to give postoperative adjuvant chemotherapy in both cases.

5 | CONCLUSION

In growing teratoma syndrome, the metastatic tumors do not decrease in size despite the normalization of serum tumor markers with chemotherapy. Because of its high recurrence and insensitiveness to chemotherapy, timely complete surgical resection is the preferred treatment, and fertility-sparing surgery should be considered for women of childbearing age wherever possible.

AUTHOR CONTRIBUTIONS

A Shrestha conceptualized the idea, reviewed the literature, and wrote the original draft manuscript; K Amatya, S Shrestha, P N Tiwari, and S Lama involved with patient care and final manuscript draft edit; H Dhakal and SR Pandey involved in photograph collection, and reviewed the literature and final manuscript draft edit.

ACKNOWLEDGEMENTS

We would like to thank our patients and their families for their kind cooperation and collaboration. We would also like to thank the members of Department of pathology and Radiology for providing Photograph involved in this research.

CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

Not applicable.

CONSENT

Written informed consent was obtained from the patient's mother in the first case and the patient and husband in

the second case to publish these case reports and any accompanying images.

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How to cite this article: Shrestha A, Dhakal H, Pandey SR, et al. Growing teratoma syndrome: Two case reports. *Clin Case Rep*. 2022;10:e05803. doi:10.1002/ccr3.5803