Elevated Serum CA19.9 Levels and Ovarian Dermoid Cyst: Report of two Cases

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Introduction

Dermoid cyst or mature teratoma is a benign ovarian tumor often found in young women. Dermoids as common benign tumors constitute one-third of all benign ovarian tumors. Although they are not malignant, but 1-2 percent of cases are cancerous especially in women over 40. There is a similar tumor but rare one called immature teratoma that is cancerous (accounting for 1 percent of all ovarian cancers).

Dermoids often cause no symptoms and are noted as ovarian enlargement on a routine pelvic exam. However, they may twist on themselves and cause severe pain, and occasionally they rupture producing peritonitis or irritation of the abdominal and pelvic cavity. In order to prevent these complications, it is recommended to remove dermoids when they are found.

Case 1

A 31-year-old woman was referred to our clinic for irregularity of her menstrual cycle. She had a body mass index of 29 kg/m². Her abdominal examination was normal but she had a palpable and mobile 5cm mass in her left adnexum in the vaginal examination. Her recent cervical smears were normal. The abdominopelvic ultrasound revealed bilateral ovarian masses (a mixed-echo cyst containing solid components in the left ovary measuring 50×60mm and another cyst measuring 33×33mm in the right ovary) and an antverted uterus of 8 cm in length with endometrial thickness of 7 mm. The ovaries were not visualized separately from the mass. All other abdominopelvic organs were reported normal in the ultrasound report.

In her laboratory tests, serum CA19.9 (Serum carbohydrate associated antigen) level was 113.3 U/ml (normal range 0-35 U/ml). Serum β-hCG (Human chorionic gonadotropin), AFP (alpha - fetoprotein), CA125 (carcinoma antigen-125) and CEA (carcinoembryonic antigen) levels were within normal ranges. An abdominopelvic CT-scan revealed a well-defined lesion with solid, cystic, calcified and fatty components in the left adnexum, measuring 5 cm in its maximum diameter. There was no lymphadenopathy and all other organs were normal. The patient’s condition and her imagings and laboratory tests were reviewed by our local multidisciplinary tumor board, meeting a preoperative diagnosis of teratoma of the left ovary with possible malignant component.

Laparotomy and ovarian cystectomy was performed. Histopathologic evaluation of the frozen section reported that the mass was a dermoid cyst. All other abdominal and pelvic organs (pancreas, stomach, liver…) were normal during surgical evaluation. The final histopathologic evaluation of multiple sections from the right ovary reported that the right ovary was normal and the left ovary with an encapsulated cyst measuring 40×50mm in diameter contained mature teratoma (dermoid cyst). Sections showed a cyst wall

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ovary contained a cyst 35×45mm. Pelvic sonography reported endometrial thickness of 6mm. Pap smear was normal. Bimanual exam was normal but two palpable and mobile 4-5 cm masses were detected in the both adnexa.

In her laboratory tests, serum CA19.9 level was 240 U/ml (normal range 0-35 U/ml). Serum β-hCG, AFP, CA125 and CEA levels were within normal ranges. An abdominopelvic CT-scan revealed a well-defined lesion with solid, cystic, calcified and fatty components in the left ovary, measuring 4.5 cm in its maximum diameter. There was no lymphadenopathy and all other organs were normal.

Laparotomy and bilateral ovarian cystectomy was performed. Histopathologic evaluation of the frozen section reported benign masses. Definite pathology report was dermoid cyst. All other abdominal and pelvic organs (pancreas, stomach, liver…) were normal during surgical evaluation. Sections showed a cyst, it’s epithelium lined with mature sebaceous glands, hair follicles, cartilage bundles and there was no dysplastic or malignant components. The CA19.9 level dropped to 10 U/ml, three weeks following the surgery.

**Discussion**

Teratomas are germ cell tumors of the ovary. Over 98% of these cases are benign; however malignant transformation occurs in less than 2% of cases. These tumors are unilateral in approximately 88% of cases and over 80% of dermoid cysts occur during reproductive years. Dermoid cysts are the most common type of ovarian tumors accounting for 27-44% of all primary ovarian tumors and 35-58% of the benign forms (1).

CA19.9 is a tumor associated glycolipid, frequently elevated in the serum of patients with gastrointestinal malignancies particularly of the pancreas. It is present in relatively high concentrations in prostatic, gastric, amniotic fluids and excretions of pancreas and duodenum in healthy individuals (2). CA19.9 could be increased in up to 50% of cases of dermoid cysts with malignant changes (2, 3). However, serum CA19.9 could be elevated in dermoid cysts (4, 5, 6, 7) and could be used at postoperative follow-up investigation in benign diseases and as a marker for examining mature cystic teratoma recurrence (7, 8). Mikuni et al. in their review of 174 dermoid cysts showed that CA19.9 had the highest positive rate among all other tumor factors (some degrees of increased levels in 45.5% of cases) in patients with

**Figure 1:** Histopathology of the first patient

lined by keratinous squamous epithelium with mature sebaceous glands, hair follicles, cartilage and nerve bundles and there was no dysplastic or malignant components. Immunohistochemistry (IHC) evaluation was done and Immature teratoma was reported (Figure 1). The CA19.9 level was dropped to 12.4 U/ml, three weeks following the first surgery.

**Case 2**

A 27-year-old woman was referred to our clinic for her facial acne. She was evaluated for polycystic ovarian disease. Ultrasonography revealed bilateral ovarian cysts with solid components (left ovary contained a mixed echo cyst 45×44mm and right
mature teratoma. Studies have also shown that there is no significant relationship between the dermoid cyst’s weight and serum CA_{19.9} concentration (6).

Atabekoglu et al. found that CA_{19.9} staining was prominent on the apical cytoplasm of the epithelial lining in immunohistochemical evaluations, suggesting that CA_{19.9} is secreted into the cystic cavity (4). If this is true, it is possible that any weakening in the cyst wall due to cyst enlargement, or any inflammations or ruptures of the dermoid cyst could cause CA_{19.9} leakage from cystic cavity into the bloodstream, resulting in elevated serum CA_{19.9} levels. Besides; directly serum excretion via epithelial surface could be another cause of increased serum CA_{19.9} levels.

In conclusion, elevated serum CA_{19.9} level may be detected in women with benign dermoid cysts. However in these cases a complete evaluation for any signs of malignant transformation should be performed.

References