Case Report

Malignant Struma Ovarii Presenting as a Vaginal Mass

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Abstract

Malignant struma ovarii encompasses a spectrum of conditions ranging from struma ovarii with microscopic, clinically unimportant papillary carcinoma to cases of struma ovarii with papillary or follicular carcinoma that have metastasized. Recently it has been proposed that highly differentiated follicular carcinoma arising in struma ovarii may resemble non-neoplastic thyroid tissue both in the ovary and at sites of dissemination and metastasis. We report a unique case of a struma ovarii with non-neoplastic appearing thyroid tissue which presented 6 years later as a vaginal metastasis of a typical thyroid-type follicular carcinoma. The present case adds to the spectrum of rare primaries metastasizing to the vagina.

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Key Words: *Malignant struma ovarii, follicular thyroid carcinoma, vaginal metastasis*.

Introduction

The term "malignant struma ovarii" has been applied both to cases of struma ovarii with atypical or malignant features on microscopic examination that are not associated with a clinically malignant course and to cases of struma ovarii with papillary or follicular carcinoma that have metastasized.[1] Tumors with the spectrum of changes lack of malignancy, "proliferative" struma ovarii have been reported to behave benignly,[2] although recently it has been proposed that well differentiated follicular carcinoma arising from struma ovarii may resemble non-neoplastic thyroid tissue both in the ovary and at sites of dissemination and metastasis.[3] We report a unique case of a struma ovarii with non-neoplastic appearing thyroid tissue which presented 6 years later as a vaginal metastasis of histologically overt thyroid follicular carcinoma.

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Case Report

A 64-year-old female presented to the emergency room with vaginal bleeding. The patient indicated that she had undergone a total abdominal hysterectomy with bilateral salpingo-oophorectomy 6 years earlier at another hospital for unknown reasons. 4 years earlier, a liver biopsy was performed at our institution for putative metastatic disease which was diagnosed as negative for tumor. Currently, physical examination revealed a polypoid, red mass in the apex of the vaginal cuff. The lesion was biopsied and histopathologic examination demonstrated metastatic follicular thyroid carcinoma with clear cell features. The patient's thyroid gland was unremarkable, no palpable mass identlified. In view of the diagnosis of metastatic thyroid carcinoma, a total thyroidectomy was performed three months later. However, pathologic examination of the thyroid showed a micropapillary carcinoma (0.01 cm in greatest dimension). No other thyroid lesions were present. Whole body iodine scan revealed extensive lung, liver, bone and vaginal metastases. A bone biopsy of the right femur also confirmed metastatic follicular thyroid carcinoma. Radioactive iodine ablation was performed at that time. The pathological report and slides from the hysterectomy and oophorectomy were reviewed and revealed a struma ovarii with hyperplastic (proliferative) changes in the right ovary. By report, the specimen was adequately sampled for the size of the tumor at the time of diagnosis. No malignant histologic features were identified in the strumal tissue. The patient presented again 2 years later with a recurrent vaginal mass with the same histological diagnosis.

The patient was followed by evaluating her thyroid function. Total thyroxine level, free thyroxine level, thyroid stimulating hormone (TSH) level, and T3 resin uptake were within normal limits. Her thyroid stimulating hormone level was increased to 13.52 MIU/ml as soon as she started the radiation therapy and remained high for the entire courses of the suppressive therapy. After the radioactive iodine therapy, she was given exogenous hormone for some time. However, 2 years later, her TSH was decreased to within normal limits without the administration of exogenous thyroid hormone, suggesting increased endogenous production from the

metastatic thyroid carcinoma. A second course of iodine ablation therapy was completed. The patient was lost during the follow up.

Pathologic Findings

The tumor from vagina measured 2 cm x 2 cm x 2 cm, with focally ulcerated overlying vaginal mucosa. Cut section revealed a variegated, hemorrhagic red-tan surface. Histologically, the tumor infiltrates the submucosa with overlying squamous mucosa (**Figure 1A**). The mass consisted of an infiltrative thyroid carcinoma composed of follicles with colloid, as well as trabecular and solid areas (**Figure 1B**). The nuclei were hyperchromatic and showed mild to moderate pleomorphism. Nuclear features of papillary thyroid carcinoma were absent. Numerous foci in the follicular areas showed clear cell changes (**Figure 1C**). Mitoses were present throughout the tumor. Immunohistochemical stains were positive for thyroglobulin and thyroid transcription factor. The bone biopsy of the right femur also showed follicular thyroid carcinoma with similar histology. No teratomatous or heterotopic benign thyroid or parathyroid elements were present in the vaginal specimen. The histopathology of the recurrent tumor 2 years later demonstrated significantly more pleomorphism, clear cell changes, and mitoses. The thyroidectomy specimen showed a micropapillary carcinoma (0.01 cm) displaying the typical nuclear features of papillary carcinoma.

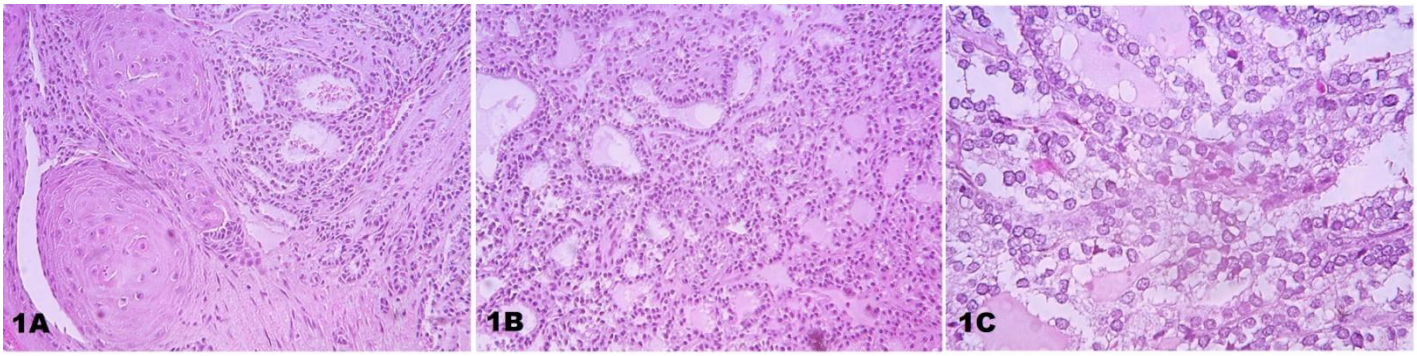

Figure 1. 1A) Vaginal mucosa with subjacent metastatic struma ovarii. **1B)** Well-differentiated follicular thyroid carcinoma. **1C)** Extensive clear cell changes.

Review of the total abdominal hysterectomy with bilateral salpingo-oophorectomy specimen revealed a right cystic and solid ovarian tumor measuring 20x15x13 cm. The cyst was unilocular and containing brown fluid with a thickened spongy area with hemorrhage, identified as struma ovarii with focal hyperplastic (proliferative) changes. There were no papillary nuclear features, vascular space or capsular invasion, mitotic activity, nor other teratomatous components present.

Discussion

The present case has two unique features, 1) metastasis to the vagina, hitherto unreported, and 2) benign histopathology in the thyroidal tissue of the struma ovarii. The lack of histologic evidence of teratomatous or heterotopic benign thyroid tissue in the vagina proximate to the tumor suggested that it did not arise nor was associated with vaginal teratoma or thyroidal differentiation from misplaced blastomere.[4] The presence of a 0.01cm micropapillary carcinoma in the total thyroidectomy specimen was not a consideration as a possible primary site.[5] The positive staining for thyroglobulin and thyroid transcription factor precluded a non-thyroidal malignancy. The only logical primary site appears to be the struma ovarii despite the benign histology of the strumal tissue.

Malignant struma ovarii is a rare tumor with an incidence of approximately 0.1-0.3%.[6] Currently, the diagnosis is based on demonstrating thyroidal tissue containing areas of unequivocal malignancy by utilizing the same histopathological criteria as those for primary thyroid carcinoma.[1] Most malignant struma ovarii demonstrate papillary carcinoma including follicular variant. The remainder is follicular carcinoma.[6] Although the diagnosis of papillary carcinoma is straightforward, the diagnosis of follicular carcinoma may be of difficult interpretation given that thyroidal tissue in the ovary is often irregularly distributed and not bound by a true capsule; therefore, evidence of malignancy in those cases must be based on cytology and/or the presence of metastases. Tumors with the spectrum of changes lack of malignancy, ie papillary hyperplasia without overlapping "ground glass" nuclei, adenomatous nodules, or adenomas, have been designated as "proliferative" struma ovarii[2] and have been reported to behave benignly. Recently, however, three cases of a well differentiated follicular carcinoma arising from struma ovarii with metachronus metastases to the peritoneum and para-aortic lymph nodes and having an innocuous histologic appearance "resembling that of non-neoplastic thyroid tissue in both the ovary and sites of dissemination and indistinguishable from so-called peritoneal strumosis" have been described in detail.[3,7,8]

Malignant struma ovarii with extraperitoneal metastases is even a rarer occurrence. Twelve cases have been described in the literature, metastasizing to the pelvic lymph nodes, lung,

liver, and bone. Among the metastatic cases, five cases were follicular carcinoma, four were follicular variant of papillary carcinoma, and three showed mixed follicular and papillary patterns.[3,6,9,10] We believe that our case represents a well differentiated follicular carcinoma in struma ovarii which metachronously metastasized as a typical thyroid-type carcinoma and presented as a vaginal mass.

Malignancies presenting as vaginal masses most often prove to be intragenital metastases, direct extension of cervical or endometrial carcinoma, or extragenital metastases of carcinomas of the rectum, colon, and breast, and less often, carcinomas of the kidney, pancreas, urinary bladder, malignant melanoma, or rarely other primaries.[11-13] The present case adds to the spectrum of rare primaries metastasizing to the vagina.

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