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A rare case of invasive mucinous adenocarcinoma of fallopian tube fimbria with metastasis to ipsilateral ovary, uterine serosa, myometrium and pelvis: Case report and review of literature☆,☆☆

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Abstract Mucinous adenocarcinoma of the fallopian tube is exceptionally rare and the detailed clinicopathologic features of these tumors have not yet been reported in English literature. Here we report a moderately differentiated mucinous adenocarcinoma arising in the tubal fimbria in a 70-year-old woman. Patient had a history of cholecystectomy for gallstones and gastric banding who presented with gastrointestinal discomfort and was found to have a large adnexal mass on imaging studies. Serum CA-125 was moderately elevated. Recent mammography, upper endoscopy and colonoscopy were completely normal. She underwent surgical staging for the adnexal mass. Frozen section and final pathology diagnosis revealed moderately differentiated adenocarcinoma arising in the left fimbria. Carcinoma had spread to the ipsilateral ovary and pelvic soft tissue at the time of her presentation. Tumor was strongly immunoreactive to CK7 and CEA, and was negative for CK20, CDX-2, PAX-8, WT-1, p16, ER, and vimentin. TP53 showed wild-type phenotype by immunohistochemistry. Molecular studies showed no mutation in codon 12 and 13 of the k-ras gene, and no mutation was detected in the BRAF and EGFR genes. In addition, the non-tumorous fimbria epithelium showed a spectrum of mucinous alterations with variable nuclear atypia: cytologically bland areas that were reminiscent of

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mucinous metaplasia were positive for p53 and showed minimal proliferation as assessed by Ki-67, and cytologically atypical stratified mucinous epithelium that was positive for p53 and Ki-67. The patient received 3 cycles of Folfox and was regularly followed at a 3–6 month interval. Her carcinoma recurred in abdomen at 32 months post surgery. After excluding the possibility of an extra-gynecologic tract primary through extensive clinical investigations and post-surgical follow-up, we concluded that this tumor most likely represented a mucinous adenocarcinoma of tubal origin.

1. Introduction

Primary fallopian tube carcinomas have traditionally been considered rare tumors, with a reported average annual incidence in the United States of 3.6 per million women per year [1]. However, the incidence appears to be increasing, an expected consequence of the recent paradigm shift that ascribes a tubal origin to a significant proportion of ovarian and pelvic epithelial carcinomas [2,3]. Most fallopian tube carcinomas are of serous type, followed by the endometrioid type [4–13]. Mucinous adenocarcinomas are exceptionally rare in the fallopian tube, and we are aware of only 3 cases previously reported in the English literature [6,8]. We describe herein a case of an advanced-stage invasive mucinous adenocarcinoma arising in tubal fimbria and review the relevant literature.

2. Materials and methods

2.1. Case history

A 70-year-old female gravida 3, para 3 with last menstrual period at age 44 presented to her primary care physician with gastrointestinal discomfort. Her medical history was remarkable for hypertension, Type II diabetes, and lichen sclerosis. She was on Evista 60 mg daily. She had a history of cholecystectomy, appendectomy, coronary artery bypass graft, gastric banding, and bilateral tubal ligation at age 32. Recent mammogram, colonoscopy and papanicolaou tests were all within normal limits. At current presentation, her physical examination was unremarkable. A chest and abdominal computerized axial tomography (CT) with contrast showed dilated esophagus due to tight gastric banding and a lobulated fluid attenuation (12.3 × 9.9 cm) in the left pelvis, which was separated from the uterus. Lungs, liver, pancreas, kidneys, spleen and bowel were normal. A pelvic ultrasound confirmed a 13 × 9.2 × 9 cm multi-septated complex mass in the left adnexa. Pre-operative serum CA-125 was elevated to 213 (normal <34). Serum CEA was normal at 0.8 ng/ml (normal 0–3.8). The patient underwent an exploratory laparotomy and resection of the left adnexal mass. Intraoperative frozen section of the mass was performed, and a diagnosis of mucinous adenocarcinoma was made. A complete surgical staging with hysterectomy, salpingo-oophorectomy, omentectomy, paraaortic and pelvic lymph node dissection was thus performed. She received 3 cycles of adjuvant chemotherapy with Folfox (folinic acid, 5-FU and Oxaliplatin). She was followed with serum CA-125 every 1–3 months during the first year post-surgery, which showed steady decline to the normal level. Other post-operative follow-up included chest and abdominal CT with contrast every 6 months, all of which were normal until the most recent study at 32 months which showed mesenteric nodularity in the anterior mid abdomen, involving the gastrocolic ligament, and in the right paracolic gutter, consistent with carcinomatosis, and an infiltrating soft tissue mass in the midline of the mid anterior abdominal wall, measuring 2 × 1.6 × 4.3 cm. The patient is currently alive with recurrent disease at 34 months post- surgery.

2.2. Histology and immunohistochemistry

Tissue sections were fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 4-μm thickness, and stained with hematoxylin and eosin. Mucin stain and the immunohistochemistry were evaluated at the Histology and Immunopathology Laboratory of Long Island Jewish Medical Center (North Shore-LIJ Health System, New Hyde Park, NY), where the Ventana BenchMark Autostainer (Ventana Medical System, Tucson, Arizona) was used on 4-μm thick formalin-fixed and deparaffinized sections with the following markers: CK7, CK20, CDX-2, CEA, PAX-8, WT-1, Vimentin, p53, Estrogen Receptor (ER), p16 and Ki-67.

2.3. Molecular studies

Tumor cells were micro-dissected from unstained slides and tumor DNA was extracted. Mutation analysis of *K-ras* (codon 12 and 13), BRAF and EGFR (codons 719, 858–861, 768, 790, Exon 19del) genes was performed at the Molecular Pathology Laboratory of Indiana University School of Medicine (Indianapolis, IN), using Applied Biosystems GeneMapper 4.0.