

# MR imaging findings of mass-forming endosalpingiosis in both ovaries: a case report

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## Abstract

A 50-year-old postmenopausal woman, who underwent ultrasonography at a periodic medical checkup, was found to have bilateral ovarian masses. Pelvic magnetic resonance imaging (MRI) showed bilateral multilocular cystic ovarian masses. The cyst walls and septal structure demonstrated contrast enhancement. She underwent bilateral salpingo-oophorectomy. Microscopic examination revealed that the cysts were lined with cuboidal or columnar epithelial cells, and some of the cells were ciliated. The final histopathological diagnosis was endosalpingiosis. Endosalpingiosis is defined as the presence of ectopic ciliated epithelium, resembling the normal endosalpinx, without endometrial stroma. It rarely presents as a tumor-like mass on MRI.

**Key words:** Endosalpingiosis—Ovary—  
Tumor-like—Magnetic resonance imaging

Endosalpingiosis is defined as the presence of ectopic ciliated epithelium, resembling the normal endosalpinx, without endometrial stroma [1]. The term “endosalpingiosis” was introduced by Sampson in 1930, when he described the local proliferative and invasive properties of fallopian tube epithelium following surgical interruption [2]. While the histogenesis of endosalpingiosis is controversial, 2 main pathogenetic mechanisms have been proposed. Endosalpingiosis might represent a multifocal metaplastic process arising from totipotential

peritoneal cells; alternatively, it may result from peritoneal implantation of sloughed tubal epithelium [3].

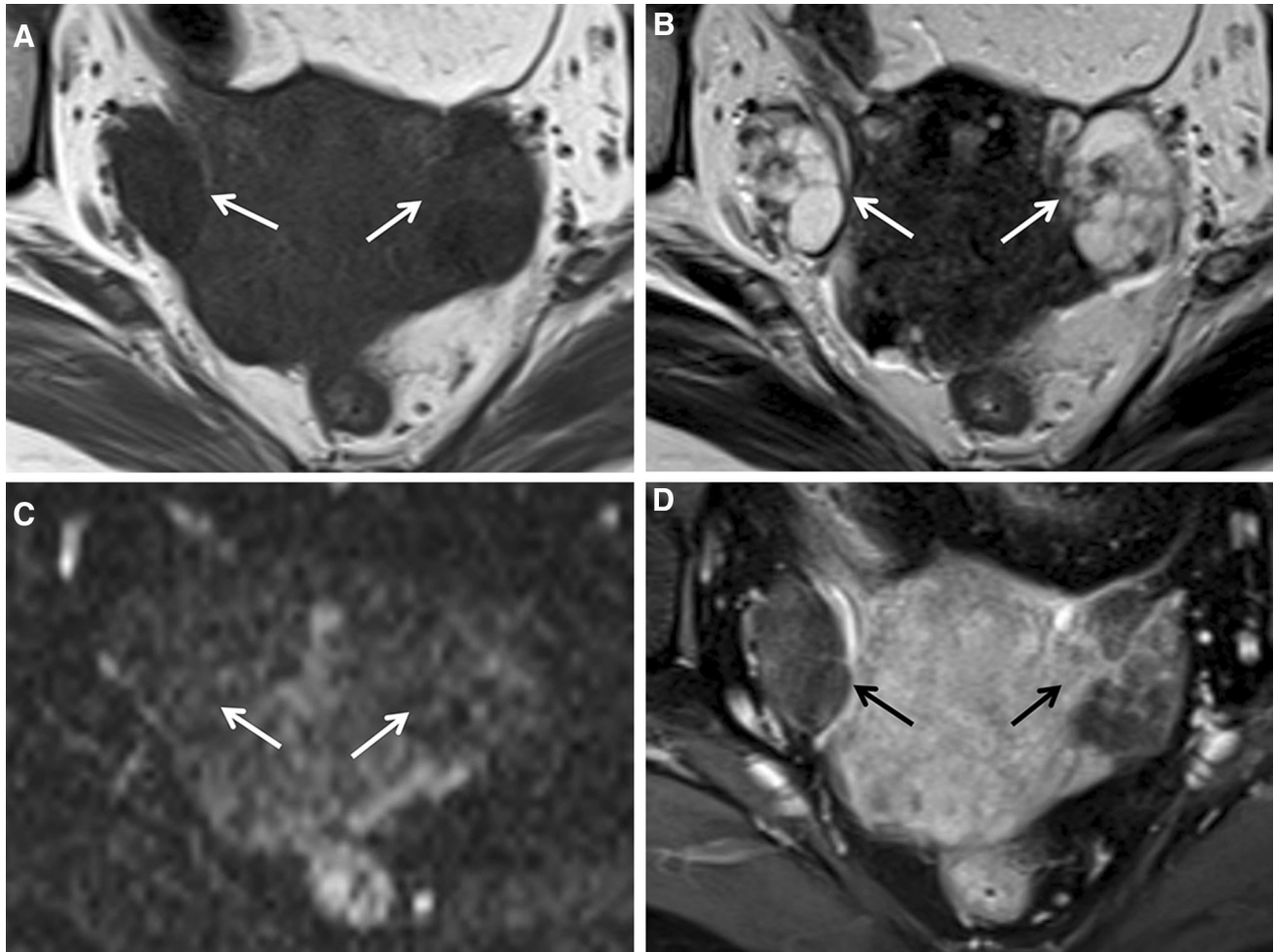
Endosalpingiosis is seen exclusively in women of reproductive age. It is usually an incidental finding on macroscopic/microscopic examination, but the frequency is relatively high. According to Zinsser and Wheeler, the prevalence is up to 12.5%, on the basis of histological examination of surgically removed omenta [4].

Endosalpingiosis rarely presents as a tumor-like cystic lesion and can be confused with a neoplasm on image examination. We report a case of bilateral ovarian multilocular cystic mass lesions, which were diagnosed as endosalpingiosis on histopathological analysis.

## Case report

A 50-year-old postmenopausal woman (gravida 2, para 2) underwent ultrasonography at a periodic medical checkup, which revealed bilateral ovarian masses. She had no significant past medical or gynecological history. Laboratory data showed no abnormalities. Ovarian tumor markers (CA125, CA19-9, and CEA) were negative. Chest radiograph, esophagogastroduodenoscopy, and colonofiberscopy were normal.

Pelvic magnetic resonance imaging (MRI) showed bilateral multilocular cystic masses. The masses were approximately 5 cm in diameter; the numerous loculi were of different sizes, up to 20 mm in maximum dimension, and had septal structure. The cystic component had low signal intensity on T1-weighted images, a generally high signal intensity on T2-weighted images, and low signal intensity on diffusion-weighted images ( $b$  value = 1000). There are several low signal intensity loculi in both ovarian masses on T2-weighted image. The cyst walls and septal structure demonstrated contrast enhancement (Fig. 1). Solid components were not



**Fig. 1.** Axial magnetic resonance images. **A** T1-weighted image, **B** T2-weighted image, **C** Diffusion-weighted image, **D** Contrast-enhanced T1-weighted image with fat suppression. Pelvic MRI shows bilateral ovarian masses (approximately 5 cm in diameter) with numerous loculi of different sizes, up to 20 mm in maximum dimension, and septal structure (*arrow*). The cystic

component has low signal intensity on T1-weighted image (**A**), mostly high signal intensity on T2-weighted image (**B**), and low signal intensity on diffusion-weighted images (**C**). There are several low signal intensity loculi in both ovarian masses on T2-weighted image. The cyst walls and septal structure demonstrate contrast enhancement (**D**). Solid components are not revealed.

revealed. Mucinous cystadenoma, metastatic ovarian tumor, and struma ovarii were suggested as differential diagnoses.

The patient underwent bilateral salpingo-oophorectomy. Gross examination of the resected specimen revealed the mass to be a multilocular cystic lesion (Fig. 2). The cystic lesion contained serous fluid. Microscopic examination revealed that the cysts were lined with cuboidal or columnar epithelial cells, and some of the cells were ciliated (Fig. 3). No cellular atypia or increased mitotic activity was seen. No endometrial-type stroma was seen. The final histological diagnosis was endosalpingiosis.

## Discussion

Endosalpingiosis is non-neoplastic proliferation of ectopic fallopian tube epithelium [5]. Occasionally, cystic changes, psammomatous bodies, and calcifications are

present. Endosalpingiosis is commonly encountered on the retroperitoneal lymph nodes, and the pelvic peritoneum covering the uterus, fallopian tubes, ovaries, and cul-de-sac. Less frequent sites include the pelvic parietal peritoneum, omentum, bladder and bowel serosa, para-aortic area, and skin [6].

Endosalpingiosis is almost always an incidental finding on microscopic examination of surgical material. Occasionally, endosalpingiosis can be visualized intraoperatively, or on careful gross inspection, as small cysts that are typically only a few millimeters in diameter [7]. Tumor-like endosalpingiosis is rare, but it is reported either on the serosal aspect of the female reproductive system or in paraovarian and extragenital locations such as the urinary bladder, colon, or appendix [8]. The pathogenesis of tumor-like endosalpingiosis is largely unknown. Clement and Young, in their series of 4 cases

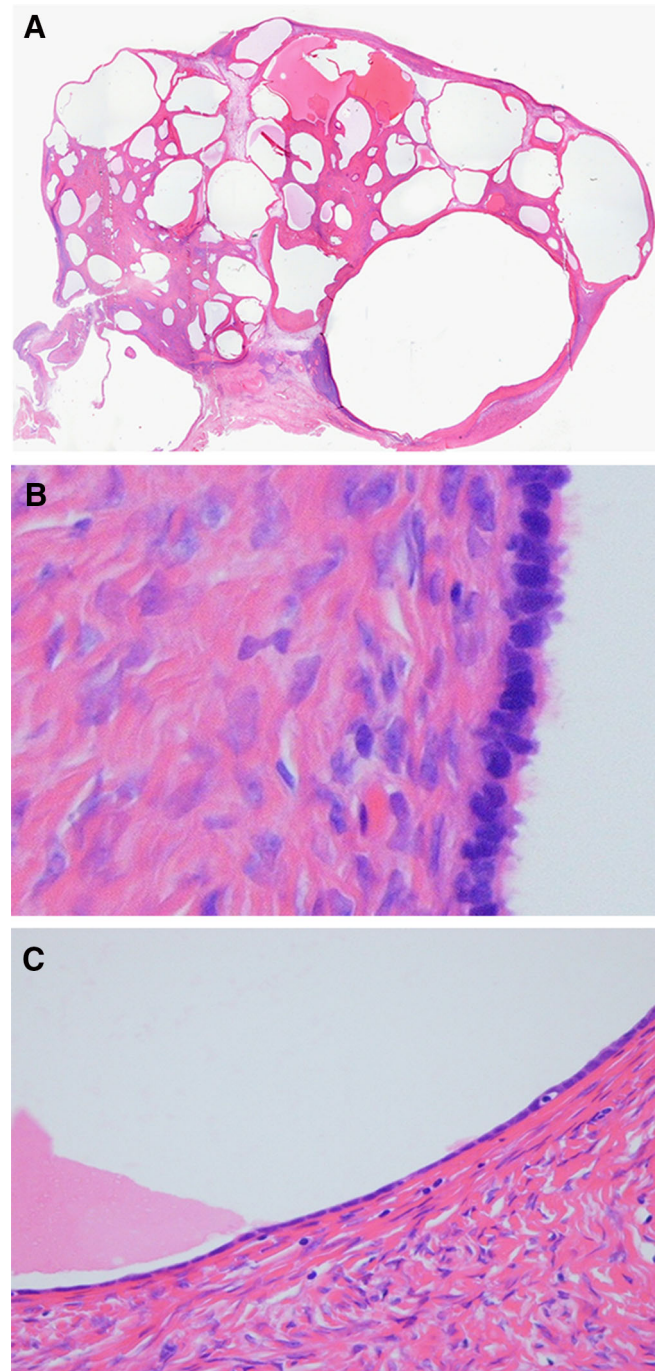


**Fig. 2.** Resected specimen. Each resected mass shows multilocular cystic appearance. The cystic components contain serous fluid.

of endosalpingiosis, described the clinical and histopathological findings of tumor-like masses, which were characterized by polypoid masses composed of multiple cysts lined by tubular-type epithelium, with hyperplastic smooth muscle tissue and myofibromatous stroma [7].

Several imaging findings of tumor-like endosalpingiosis have been reported (Table 1), but the typical image contributing to the diagnosis for tumor-like endosalpingiosis has not been reported. In previous case reports, computed tomography (CT) and MRI findings of endosalpingiosis were described as ill-defined or well-circumscribed pelvic mass, with variable solid and cystic components [8–10]. The cystic component mostly shows low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. After contrast administration, solid components show heterogeneous enhancement [8, 9]. Our case showed bilateral multilocular cystic ovarian masses, and loculi mostly demonstrated a signal intensity corresponding to serous fluid. Our findings are similar to those of previous reports. Other previous case reports demonstrate an intramyometrial unilocular cyst without blood signal on T1- and T2-weighted images [11], and a submucosal tumor of the urinary bladder [12]. Multiple disseminated pelvic calcifications in endosalpingiosis have also been described on CT [5].

In our case, bilateral ovarian mucinous cystadenoma, metastatic ovarian tumor, and struma ovarii were considered as differential diagnoses on MRI. Mucinous cystadenoma is almost always unilateral, large, and multilocular, with a smooth contour and honeycomb appearance, and may be large. In many of these tumors, the individual loculi on MRI and CT scans may vary as a result of differences in the degree of hemorrhage or protein content [13]. Our case did not show a unilateral large mass and variable signal intensity in the loculi. Imaging findings of ovarian metastases are nonspecific and typically bilateral, consisting of predominantly solid components that are strongly enhancing or a mixture of



**Fig. 3.** Histopathological specimens **A** Hematoxylin-eosin stain (loupe image). **B** Hematoxylin-eosin stain (high-power field). **C** Hematoxylin-eosin stain (high-power field). The lesion shows a multicystic appearance (**A**). Microscopically, the cysts are lined by cuboidal or columnar epithelial cells, and some of the cells are ciliated (**B**). No endometrial-type stroma is seen (**C**).

cystic and solid areas. Metastases can also be predominantly cystic [14], similar in appearance to our case. Struma ovarii has some characteristic MR appearance of a multilobulated complex mass with thick septa, multiple

**Table 1.** Review of literature about CT and MRI findings of tumor-like endosalpingiosis

Authors	Age	CT/MRI
Bazot et al. [5]	37	CT: Multiple calcified nodules on the pelvic peritoneum and uterus
Katre et al. [8]	32	CT: Diffusely infiltrative, complex solid-cystic peritoneal mass with variable enhancement
Taneja et al. [9]	40	MRI: Heterogeneously enhancing complex cystic mass involving posterior myometrium at uterocervical junction and extending into pouch of Douglas CT: Irregular soft tissue mass
Lee et al. [10]	52	CT: Two pelvic tumors with mixed cystic and solid areas adjacent uterus
Cil et al. [11]	45	MRI: Intramural hyperintense cystic lesion in the uterine fundus adjacent to the endometrium and a right ovarian cystic mass on T2WI
Arai et al. [12]	47	MRI: Submucosal tumor of urinary bladder

cysts of variable signal intensities, and enhancing solid components [15]. Besides, struma ovarii is usually unilateral. However, our case showed bilateral and smooth surface. Histologically, serous cystadenoma of the ovary was considered in the differential diagnosis. Recently, it has been hypothesized that endosalpingiosis and serous neoplasms (serous cystadenoma, borderline, and low-grade serous adenocarcinoma) may also originate in the fallopian tube [16]. An association between endosalpingiosis and these serous neoplasms has been recognized for many years in the pathologic literature. Endosalpingiosis is theorized to be the precursor lesion in that serous neoplasms are found on the peritoneum or in lymph nodes [17, 18]. Besides, the cyst wall of serous cystadenoma is lined by a single layer of columnar epithelial cells, and some of the cells are ciliated [19]. Such findings are sometimes difficult to differentiate from those of endosalpingiosis [7]. However, a multilocular cystic appearance, composed of numerous small loculi, is not a typical finding for serous cystadenoma.

In conclusion, we reported a case of bilateral ovarian endosalpingiosis presenting as multilocular cystic masses. Although it is difficult to diagnose endosalpingiosis on MRI, it is important to note that ovarian endosalpingiosis can present as multilocular cystic lesions, which are similar in appearance to pelvic endosalpingiosis.

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