

# Coexistence of Brenner tumor and struma ovarii: case report

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## Summary

**Background:** There has been controversy regarding the histogenesis of Brenner tumors. It is generally accepted that Brenner tumors are derived directly from ovarian surface epithelium, which undergoes metaplasia to form the typical urothelial-like components, whereas some investigators assume that Brenner tumors arise from immature germ cells.

**Case:** We describe a well-documented case of the coexistence of struma ovarii regarded as a form of teratoma and Brenner tumor in the same ovary. Immunohistologically, not only columnar cells of thyroid follicles, but also transitional cells of Brenner nests were positive for thyroglobulin.

**Conclusions:** In the present case, Brenner tumors and thyroid elements coexisted and were positive for thyroglobulin. While there is strong evidence that pure Brenner tumors originate mostly from the ovarian surface, at least Brenner tumors associated with teratomatous elements may have a germ cell origin.

**Key words:** Brenner tumor; Struma ovarii; Thyroglobulin.

## Introduction

There has been controversy regarding the histogenesis of Brenner tumors. It is generally accepted that Brenner tumors are derived directly from ovarian surface epithelium, which undergoes metaplasia to form the typical urothelial-like components [1], whereas some investigators assume that Brenner tumors arise from immature germ cells [3-7].

We describe a rare case of coexisting Brenner tumor and struma ovarii, which supports the germ cell theory of Brenner tumors.

## Case Report

A 43-year-old woman was transferred because of massive vaginal bleeding at 37 weeks' gestation and underwent an emergency cesarean section under a diagnosis of placenta previa. Her prenatal course and medical history was unremarkable. The patient had had three normal pregnancies and deliveries. The family history was noncontributory. At laparotomy, bilateral ovarian tumors were found. There were no ascites or obvious lymph node swelling. Enucleation of the bilateral tumors was performed. The left ovarian tumor was 6 x 6 x 4 cm in diameter, and pathology confirmed a mature cystic teratoma. The macroscopic examination of the right-sided specimen revealed a 4 x 4 x 3 cm mass. On opening, it was composed of numerous cysts, the largest of which were filled with colloid-like material. Microscopy disclosed two distinctive patterns. Approximately 80% of the tumor consisted of typical mature thyroid tissue, which was made up of micro- to normo-sized follicles composed of columnar cells, most of which contained abundant PAS-positive colloid. The second pattern of tumor showed typical Brenner nests embedded in dense stroma. Several nests appeared grossly dilated with wide cystic cavities,

and a transition from typical Brenner epithelium to mucinous columnar monolayer epithelium was observed within the nests (Figure 1). Immunohistologically, not only columnar cells of thyroid follicles, but also transitional cells of Brenner nests displayed reactivity for thyroglobulin.

The postoperative course was uneventful, and the patient was discharged the 8th day postoperatively.

## Discussion

Although the combination of mature cystic teratoma with struma ovarii [2] and Brenner tumor with mucinous cystadenomas has been well documented [1], the coexistence of struma ovarii, regarded as a form of teratoma and Brenner tumor in the same ovary is quite exceptional. The histogenesis and the pathogenetic mechanisms, which might explain the coexistence of both tumors in the same patient, have long been the subject of speculation. Two theories to explain the histogenesis of Brenner tumors have been suggested, including derivation from ovarian surface epithelium, which is presently the most favored view, and from immature germ cells.

The theory of surface epithelial derivation is reflected by the present classification of Brenner tumors among the surface epithelial-stromal tumors. Their cellular features are similar to those of Walthard's cell rests, epithelial inclusions found most commonly beneath the serosa of the Fallopian tubes but also occasionally in the hilar regions of the ovaries [1]. The theory of germ cell derivation was proposed by Moon and Waxman [3], who reported a case of ovarian tumor composed of Brenner and thyroid elements, although they did not completely disregard the possibility of the collision of two different tumors. Elemenoglou *et al.* [6] reported a case with a mixed lesion composed of struma ovarii and Brenner

Revised manuscript accepted for publication August 2, 2004

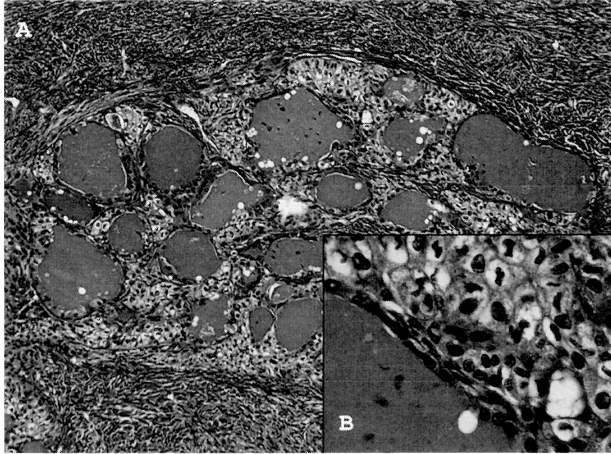


Figure 1A. — Thyroid follicles intermingle with Brenner tumor cells (H&E x 100).

Figure 1B. — Imperceptible merging of thyroid epithelium and Brenner tumor cells is demonstrated (H&E x 800).

tumor in which the proportion of Brenner tumor to thyroid tissue was 1:4 and considerable admixture of the two elements and possible transition were observed. In our case, the proportion of Brenner tumor to thyroid tissue was also 1:4 and transition from Brenner epithelial cells to thyroid epithelium was observed. The recent finding that the bleeding of thyroid follicles with solid and cystic Brenner tumor components was highlighted immunohistochemically would be compatible with the notion that at least some Brenner tumors may be derived from germ cells. While there is strong evidence that pure Brenner tumors originate mostly from the ovarian surface, at least Brenner tumors associated with teratomatous elements may have a germ cell origin.

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