Virchows Arch (1995) 426:641–645

CASE REPORT

E. Carabias · H. Garcia Muñoz · F.P. Dihmes
M.A. López Pino · C. Ballestín

Primary mucinous cystadenocarcinoma of the retroperitoneum

Report of a case and literature review

Received: 15 July 1994 / Accepted: 5 April 1995

Abstract Primary retroperitoneal mucinous cystadenocarcinoma (PRMC) is a rare tumour, similar to its ovarian counterpart but without any evidence of ovarian, pancreatic or another extra-retroperitoneal origin. Histogenesis of this neoplasm remains uncertain. Mucinous or coelomic metaplasia of retroperitoneal mesothelium has been recently proposed as its origin. In a 43-year-old woman with a 15-cm cystic lesion in the right retroperitoneum mucinous cystadenocarcinoma was diagnosed, and no primary tumour was identified. Two peritoneal endometriotic foci were found on further surgery. We suggest a common histogenesis for PRMC and these endometriotic foci.

Key words Mucinous cystadenocarcinoma · Retroperitoneum · Endometriosis · Coelomic metaplasia

Introduction

Primary mucinous cystadenocarcinoma of the retroperitoneum (PRMC) is a cystic and often multilocular neoplasm lined by a pseudo-stratified mucinous epithelium with atypical features; it is similar to its ovarian counterpart and there is no evidence of a primary lesion in ovaries, pancreas, gallbladder, appendix or any other abdominal structure.

This is a rare tumour; 13 cases have been reported in the literature [1–3, 9–11, 13, 15, 17, 18]. Although several origins have been postulated, its histogenesis has not been defined.

E. Carabias[1] (✉) · H. García Muñoz · F.P. Dihmes · C. Ballestin
Department of Anatomical Pathology,
Doce de Octubre University Hospital, Madrid, Spain

M.A. López Pino
Service of Radiology, Doce de Octubre University Hospital,
Madrid, Spain

Mailing address
[1]Dra Carabias López, Dpto. Anatomía Patológica,
Hospital "Doce de Octubre", Ctra. Andalucía, Km 5.400,
E-28041 Madrid, Spain

Clinical history

A 43-year-old woman complained of a palpable right-sided abdominal mass.

CT scan with oral and i.v. contrast before surgery (Fig. 1) showed a large and rounded, hypodense, fluid-density mass, thin-walled, located in the right hemiabdomen. The adjacent organs were displaced but not involved. The tumour never contacted the right adnexae (Fig. 2).

The lesion was completely excised. On surgery, no involvement of any abdominal viscera was observed. The gallbladder, with cholelithiasis, and the appendix were also removed. Total hysterectomy and bilateral oophorectomy were performed in a later surgical operation. In this second operation, the peritoneal cavity, retroperitoneal space and pancreas were examined. Two nodules (each 1 cm in diameter) were found in the pouch of Douglas.

The patient received the same oncological treatment as do women with an ovarian low-grade mucinous cystadenocarcinoma. The levels of serum tumour markers (CA125, CA195, CA19,9 and CEA) were within normal limits. Two years after surgery, the patient was healthy and free of recurrence.

Materials and methods

Representative samples were taken from all the formalin-fixed surgical specimens, and the tumour wall was exhaustively sampled. Histological slides from paraffin-embedded blocks were stained with HE, and more representative slides were stained with PAS (with and without diastase digestion), Alcian Blue and immunolabelled antisera [Cam5, 2 (Becton-Dickson, Mount View, Calif.); AE-1 and AE-3 (Biogenex, San Ramón, Calif.); EMA (Dako, Glostrup, Denmark) CEA (Dako), CA125 (CIS-Limited, High Wycombe, UK) and chromogranin A (Biogenex)]. Immunohistochemical investigations were carried out using the avidin-biotin peroxidase technique.

Pathological findings

Grossly, the tumour was a 15-cm, smooth-surfaced, well-encapsulated cyst filled with mucin and showing a microcystic and papillary inner lining that did not penetrate

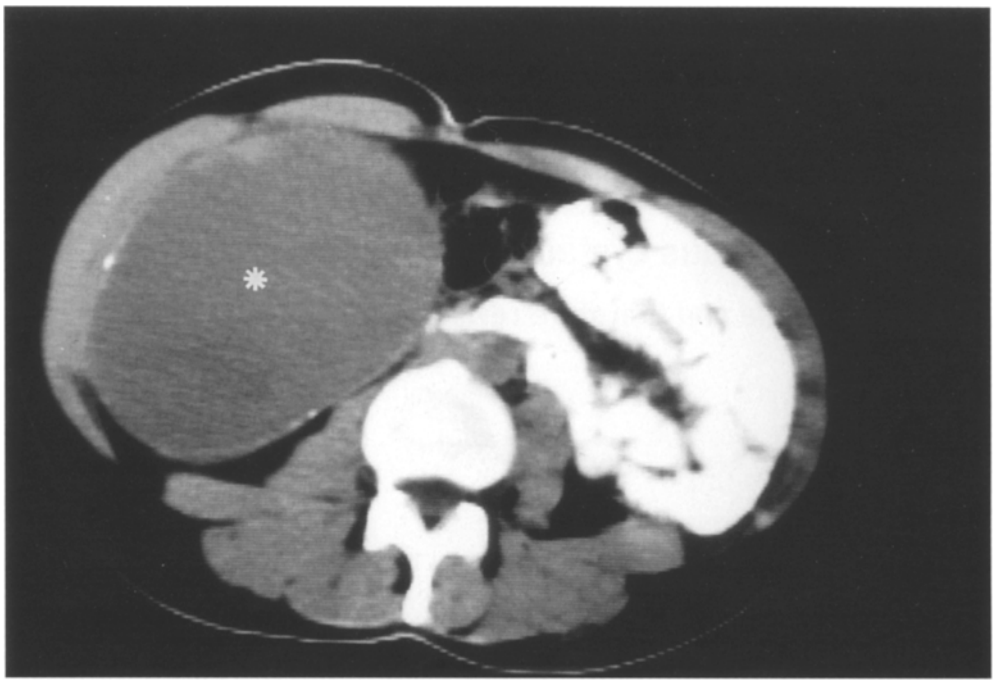

Fig. 1 CT of the lower abdomen shows a large, rounded cystic mass (*) on the right

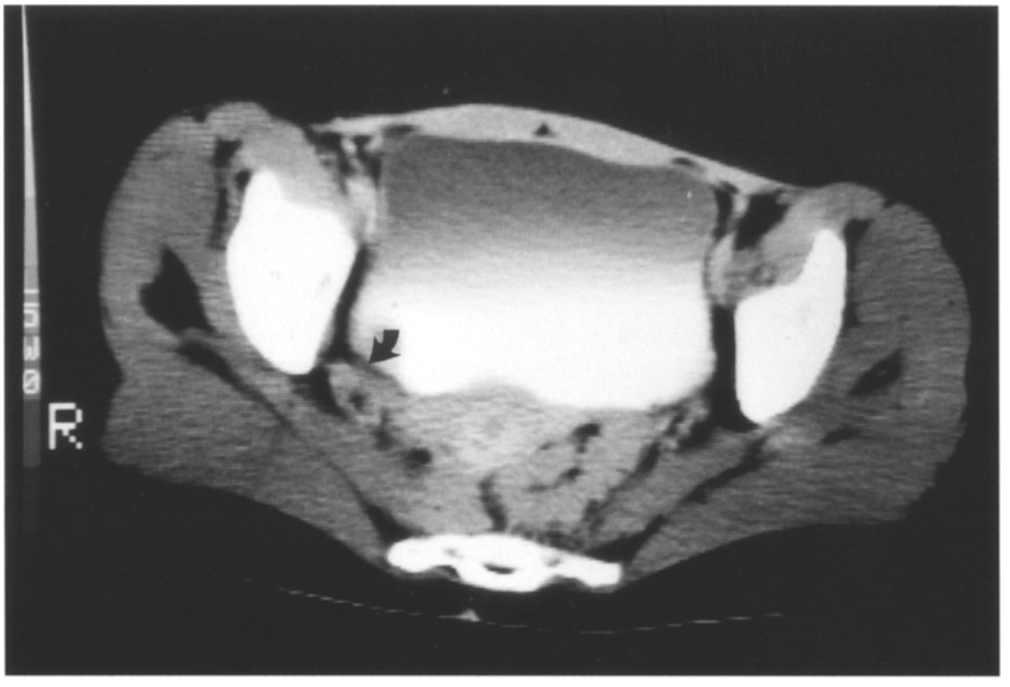

Fig. 2 CT showing a normal right adnexa (*arrow*) in a premenopausal woman

the tumour capsule. Microscopically, the papillary lining was covered with columnar epithelial cells. These cells displayed basally located nuclei and a clear cytoplasm staining for PAS (with or without diastase digestion) and Alcian Blue. This epithelium mimicked endocervical mucinous cells. The endocervical-type cells alternated with markedly atypical cells displaying cellular pleomorphism and frequent figures of mitoses (Fig. 3). Focally, stromal infiltration was seen (Fig. 4). Immunohistochemically the epithelial cells were positive with Cam5,2, AE-1 and AE-3, EMA and CEA, but did not stain with CA125. The epithelium contained scattered endocrine cells (Fig. 5). Exhaustive sampling from the cyst wall did not reveal ovarian stroma, smooth muscle or teratomatous elements. The tumour was a low-grade mucinous cystadenocarcinoma similar to its ovarian counterpart.

No relevant histological lesions were observed in the excised gallbladder or appendix, and the right ovary contained only a small haemorrhagic corpus luteum cyst. Two nodules from the pouch of Douglas were found to be peritoneal endometriotic foci.

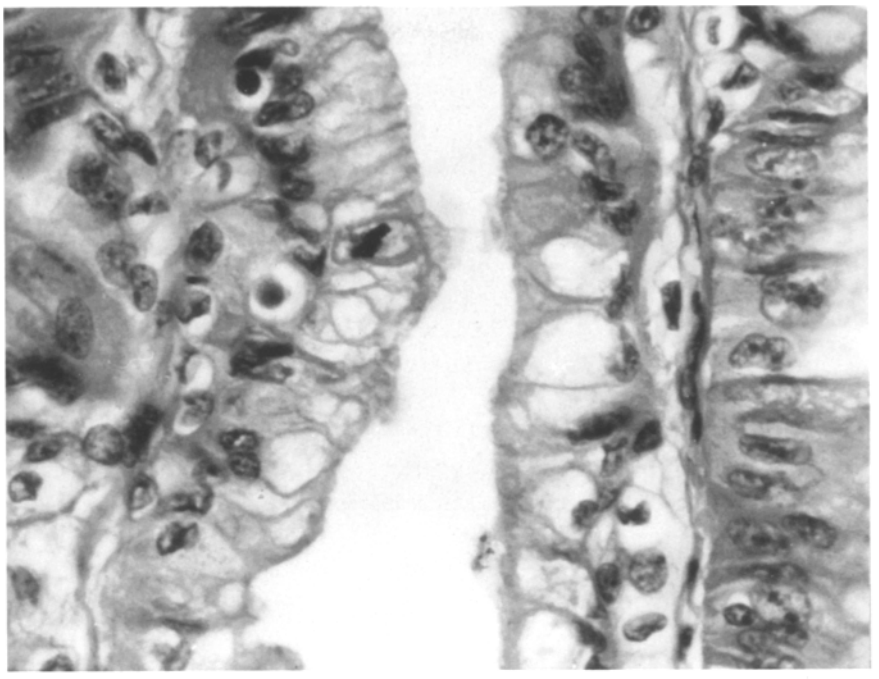

Fig. 3 The cyst epithelium shows pseudostratification and mitoses. HE, ×400

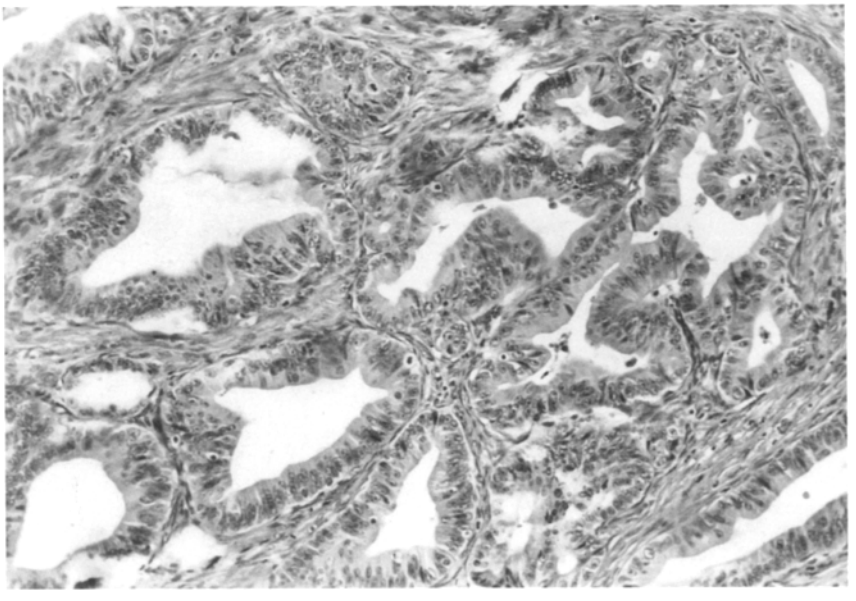

Fig. 4 Stromal invasion by atypical glandular structures. HE, ×100

Discussion

Peritoneal, and particularly retroperitoneal, cystic masses are very uncommon lesions [19]. Several cases of mucinous cystic tumours of the retroperitoneum, including primary cystadenomas, have been reported in the literature [12]. However, only 13 cases of PRMC have been published to date (Table 1). A possible metastatic origin was ruled out in all 13, since no primary lesion was demonstrated.

Only four origins of PRMC have been discussed: ectopic ovaries, cystic hamartomas or teratomas, bowel duplications and metaplasia (coelomic or mucinous). Because of similarities between PRMC and ovarian mucinous cystadenocarcinomas, some authors [3, 13, 15] support an origin from heterotopic ovaries. However, in none of the 13 reported cases has ovarian tissue been observed. Other investigators have discussed the development of PRMC from ovarian-type teratomas [10, 18]. Migratory arrest of germ cells would explain the existence of these retroperitoneal teratomas, but no other teratoid components have been reported in the previous cases. An origin from bowel duplications has been proposed by Vara Thorbeck et al. [18], who stress that the presence of these duplications does not imply any connection with the digestive tract; an embryogenic failure can cause duplication as an additional feature. The lack

Table 1 Cases of primary mucinous retroperitoneal cystadenocarcinoma reported in the literature up to mid-1994 (*UD* unknown data)

Reference	Sex	Age (years)	Location	Size	Surgical treatment	Any other therapy	Evolution
[13]	Female	48	Left hemiabdomen	550 g	Tumour excision	UD	Spreading and death 6 months after surgery
[15]	Female	UD	UD	UD	Tumour excision	Chemotherapy	Recurrence
[18]	Female	48	Right hemiabdomen	20 cm	Tumour excision	No	No recurrence 6 months after surgery
[2]	Female	69	Right iliac fossa	23 cm	Tumour excision	No	No recurrence 36 months after surgery
[10]	Female	35	Right iliac fossa	20 cm	Tumour excision	No	No recurrence 22 months after surgery
[1]	Female	47	Left hemiabdomen	13 cm	Excision of tumour+spleen+left adrenal	UD	UD
	Female	38	Left hemiabdomen	11 cm	Excision of tumour+descending colon+left uterine adnexa	UD	Mediastinal metastases 4 years after surgery
[11]	Female	40	Right hemiabdomen	24 cm	Excision of tumour+uterus +uterine adnexa	No	No recurrence 3 months after surgery
[3]	Female	44	Right iliac fossa	12.5 cm	Tumour excision	Chemotherapy	Spreading and death 4 months after surgery
[17]	Female	46	Right iliac fossa	20 cm	Tumour excision	UD	UD
	Female	45	Left iliac fossa	20 cm	Tumour excision	UD	UD
[9]	Female	42	Right hemiabdomen	11 cm	Tumour excision	UD	UD
	Male	63	Right hemiabdomen	6 cm	Tumour excision	UD	UD

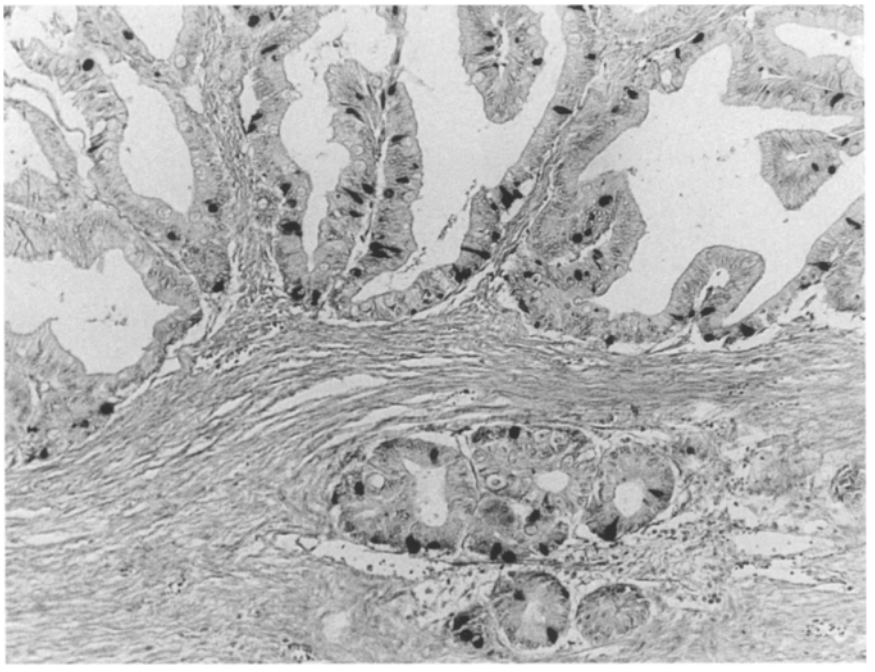

Fig. 5 The cyst epithelium contains scattered endocrine cells. Immunostaining for chromogranin. HE, ×60

of intestinal mucose or smooth muscle structures in the 13 published cases does not support the bowel duplication hypothesis.

The fourth histogenetic hypothesis supports an origin from a peritoneal inclusion cyst, assuming that its mesothelial lining has undergone metaplasia to a coelomic epithelium similar to the ovarian one [1, 2, 11]. PRMC would develop from such epithelium, probably after its mucinous transformation. The observation of mesothelium and typical mucinous epithelium next to cystadeno-

carcinomatous foci on the cyst lining [1, 2] supports this theory. In the same way, coelomic metaplasia has been proposed as a likely origin for peritoneal endometriosis [4] and has also been defended by those who consider peritoneum as a secondary müllerian system [6, 7, 8]. Since peritoneal endometriosis has been described in males [5], this theory applies also to those PRMCs found in men [9]. New techniques, such as immunohistochemistry and DNA analysis (mutation of K-*ras* oncogene) [17], in fact show that PRMC shares genotypic abnormalities and patterns of differentiation with ovarian mucinous tumours. These, as studied by Tenti et al. [16], frequently express gut antigens (gastric, intestinal and pancreatobiliary). The immunohistochemical profile of the two cases of PRMC studied by the same group [17] is similar to the pattern of ovarian mucinous neoplasms, and this may indicate similar mechanisms in their histogenesis.

In the present case, we found neither ovarian tissue, nor teratoid components nor digestive tract remnants that would have supported any of the three former hypotheses. The most likely histogenesis is coelomic and mucinous metaplasia of the retroperitoneal mesothelium, although our case did not show the epithelial transition from mesothelium observed by others [1, 2].

We would like to emphasize in our case the coexistence of PRMC with peritoneal endometriotic foci, which has not been described previously. Because of this, and since neoplasms have sometimes arisen from endometriosis [5, 14], malignant transformation from an endometriotic focus appears likely. However, no endometriotic tissue was observed in the numerous samples taken from the mass. Nevertheless, the presence of peritoneal endometriosis and PRMC is an argument in favour of both lesions having a common pathogenesis related with the hypothesized peritoneal secondary müllerian system.

Acknowledgements We are grateful to Prof. G. Klöppel for his valuable contribution to the immunohistochemical study of this case and for all his editorial help.

References

1. Banerjee R, Gough J (1988) Cystic mucinous tumours of the mesentery and retroperitoneum: report of three cases. Histopathology 12: 527–532
2. Fujii S, Konishi I, Okamura H, Mori T (1986) Mucinous cystadenocarcinoma of the retroperitoneum: a light and electron microscopic study. Gynecol Oncol 24: 103–112
3. Gotoh K, Konaga E, Arata A, Takeuchi H, Mano S (1992) A case of primary retroperitoneal mucinous cystadenocarcinoma. Acta Med Okayama 46: 49–52
4. Kurman RJ (ed) (1994) Blaustein's pathology of the female genital tract, 4th ed. Springer, New York Berlin Heidelberg, pp 661–662
5. Kurman RJ (ed) (1994) Blaustein's pathology of the female genital tract, 4th ed. Springer, New York Berlin Heidelberg, pp 678–679
6. Lauchlan SC (1972) The secondary Müllerian system. Obstet Gynaecol Surv 27: 133–146
7. Lauchlan SC (1984) Metaplasias and neoplasias of Müllerian epithelium. Histopathology 8: 543–557
8. Lauchlan SC (1994) The secondary Müllerian system revisited. Int J Gynecol Pathol 13: 73–79
9. Motoyama T, Chida T, Fujiwara T, Watanabe H (1994) Mucinous cystic tumor of the retroperitoneum. A report of two cases. Acta Cytol 38: 261–266
10. Nelson H, Benjamin B, Alberty R (1988) Primary retroperitoneal mucinous cystadenocarcinoma. Cancer 61: 2117–2121
11. Park U, Han KC, Chang HK, Huh MH (1990) A primary mucinous cystadenocarcinoma of the retroperitoneum. Gynecol Oncol 42: 64–67
12. Pennell TC, Gusdon JP Jr (1989) Retroperitoneal mucinous cystadenoma. Am J Obstet Gynecol 160: 1229–1231
13. Roth LM, Ehrlich CE (1977) Mucinous cystadenocarcinoma of the retroperitoneum. Obstet Gynecol 49: 486–488
14. Scully RE, Richardson GS, Barlow JF (1966) The development of malignancy in endometriosis. Clin Obstet Gynecol 9: 384–411
15. Storch MP, Raghavan U (1980) Mucinous cystadenocarcinoma of the retroperitoneum. Conn Med 44: 140–141
16. Tenti P, Aguzzi A, Riva C, Usellini L, Zappatore R, Bara J, Samloff M, Solcia E (1992) Ovarian mucinous tumors frequently express markers of gastric, intestinal, and pancreatobiliary epithelial cells. Cancer 69: 2131–2142
17. Tenti P, Romagnoli S, Pellegata NS, Zappatore R, Giunta P, Ranzani GN, Carnevali L (1994) Primary retroperitoneal mucinous cystoadenocarcinomas: an immunohistochemical and molecular study. Virchows Arch 424: 53–57
18. Vara Thorbeck C, Gustein D, Salvi M, Plata J (1984) Cistoadenocarcinoma enteroide retroperitoneal (posible origen intestinal). Rev Esp Enf Ap Digest 66: 329–334
19. Walker AR, Putman TC (1973) Omental, mesenteric and retroperitoneal cysts: a clinical study of 33 new cases. Ann Surg 178: 13–19