Malignant eosinophilic ascites due to metastatic urothelial carcinoma with peritoneal carcinomatosis

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DESCRIPTION

A 59-year-old man with a history of tobacco use presented for worsening abdominal pain and swelling associated with weight loss and haematuria. Physical examination revealed a thin-appearing man with tense ascites and a palpable mass in the right lower quadrant. Initial laboratory studies revealed a neutrophil-predominant leucocytosis of $27.64 \times 10^3/\mu\text{L}$ with an absolute eosinophil count of $4.05 \times 10^3/\mu\text{L}$. CT of the abdomen and pelvis showed nodular thickening of the bladder wall and diffuse peritoneal carcinomatosis with large volume ascites.

A paracentesis was performed, revealing an ascitic fluid containing 1746 leucocytes/ μL , of which 40% were eosinophils. Notably, the serum-ascites albumin gradient was $<1.1 \text{ g/dL}$, the ascitic protein $>3.5 \text{ g/dL}$, and cytology positive for malignant urothelial cells (figure 1). Diagnostic evaluations for bacterial peritonitis, tuberculosis, parasitic infection, urinary ascites due to bladder perforation and other haematological disorders were unrevealing. Specifically, serum antibody testing for *Strongyloides* and *Toxocara*, interferon- γ release assay and ascitic fluid adenosine deaminase, and flow cytometry were negative. There were no clinical or imaging findings to suggest hydatid cyst rupture, chronic pancreatitis, vasculitis or Crohn's Disease. Transurethral resection of bladder tumour revealed a poorly differentiated plasmacytoid variant of urothelial carcinoma with deep muscle invasion surrounded by eosinophils (figure 2). Our patient was later discharged with plans to follow-up with oncology, but he presented to the hospital

Figure 2 Bladder biopsy with dysplastic surface urothelial lining and tumour cells within lamina propria surrounded by eosinophils (H&E 20 $\times$).

several days later with rapidly accumulating ascites, requiring placement of a palliative peritoneal catheter. He ultimately opted for hospice care.

Malignant eosinophilic ascites in the setting of urothelial carcinoma with extensive peritoneal carcinomatosis is an exceedingly rare clinical scenario that, to our knowledge, has not been previously reported. Malignant ascites is facilitated by increased vascular permeability due to peritoneal carcinomatosis, portal hypertension due to massive liver metastasis or cirrhosis, or lymphatic channel disruption.^{1 2} The ascitic fluid profile in our case was classic for peritoneal carcinomatosis without massive liver metastasis.^{1 3} While urothelial carcinoma uncommonly leads to peritoneal carcinomatosis and ascites, accounting for approximately 1% of all cases of malignant ascites, the plasmacytoid variant may have a proclivity for both.^{4 5} However, cellular differentials of the ascitic fluid are often incompletely reported or omitted, and none are detailed as eosinophilic. Eosinophilic ascites itself has a wide differential diagnosis, requiring scrutiny for both benign and malignant conditions.^{6 7} Our patient's pathological diagnosis of poorly differentiated plasmacytoid variant of urothelial carcinoma likely explains the clinical findings of diffuse peritoneal involvement and rapidly accumulating ascites.

It is possible that the eosinophilic ascites in our case was facilitated by the tumour-associated tissue eosinophilia surrounding the malignant cells in the ascitic fluid and bladder biopsy specimens. Eosinophils are thought to have antitumour effects and are often present within tumours. In some cases, the presence of eosinophils has shown a favourable outcome, in others a worse, and in bladder cancer

Figure 1 Ascitic fluid cell block section showing discohesive plasmacytoid urothelial tumour cells with abundant cytoplasm, eccentric nuclei and inconspicuous nucleoli. The surrounding stroma appears loose and many accompanying eosinophils are also noted (H&E 10 $\times$).

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there may be no difference at all.⁸ While malignant eosinophilic ascites is rarely encountered, our case implicates urothelial carcinoma with peritoneal carcinomatosis as a newly recognised cause that clinicians should consider.

Learning points

- ▶ Ascitic eosinophilia may be due to entities such as tuberculosis, parasitic infections and hypereosinophilic syndromes. However, malignancy should also be considered.
- ▶ Eosinophilia often occurs at the sites of tumour cells, known as tumor-associated tissue eosinophilia, but the overall effect remains unclear.
- ▶ The likely mechanism of tumour-related eosinophilic ascites from carcinomatosis starts with increased vascular permeability and lymphatic obstruction. The eosinophils are then introduced into the ascites with the tumour cells.

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