CASE REPORT

Unusual presentation of a late-onset recurrence of malignant peritoneal mesothelioma

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SUMMARY

A man aged 79 years with a history of malignant peritoneal mesothelioma presented 8 years after primary presentation with a suspected right-sided painful inguinal hernia and hydrocele, both present for 5 months. During surgery, however, the inguinal swelling appeared to be a tumour. Laboratory examination was non-alarming and ultrasonography not specific for mesothelioma. Pathological examination showed it to be a recurrence of the malignant mesothelioma, which was treated palliative with radiotherapy. This clinical picture is rare and a recurrence-free survival of 8 years is remarkable.

BACKGROUND

Malignant mesothelioma is a rare neoplasm of the serosal membranes. In <20%, it originates from the peritoneum;^{1–6} more uncommon sites of origin include the pericardium, tunica vaginalis and hernial sac. Malignant peritoneal mesothelioma clinically presenting as an inguinal hernia is extremely rare.

Diffuse peritoneal malignant mesothelioma (DPMM) is known to have a poor prognosis, making the long survival we describe in this case noteworthy.

We report a case of a man aged 79 years with a history of malignant peritoneal mesothelioma with an exceptionally long recurrence-free survival and an unusual presentation of the final recurrence.

CASE PRESENTATION

Medical history

Our patient had a medical history of chronic obstructive pulmonary disease, hypertension, hypercholesterolaemia, chronic renal insufficiency, atrial fibrillation, epilepsy and, in 1999, urothelial carcinoma of the bladder treated curatively with transurethral resection. He smoked 15 cigarettes a day for the past 50 years, and stopped excessive drinking 30 years ago. He had a history of asbestos exposure due to his career in shipbuilding. All of his coworkers died from asbestos-related diseases. Eight years ago, at the age of 71, he was diagnosed with malignant peritoneal mesothelioma, which was localised just above the navel; pathological examination showed expansion into fat, however no evident stromal invasion. Microscopically, the tumour was of the epithelioid type, histochemically PAS-positive, granular-positive and diastase-sensitive (glycogen). Immunohistochemically, the tumour was positive for keratine AE1/3, vimentine and calretinin, but negative for CEA, PSA and TTF-1. The sample was revised by the Dutch

National Mesothelioma Panel which drew the final conclusion of DPMM. Treatment consisted of surgical removal. After three operations, pathological examination still revealed microscopically positive margins. Therefore, adjuvant treatment consisting of radiotherapy (45 Gy) was started. Yearly follow-ups, including laboratory work up and abdominal CT scans, showed no recurrence. After 6 years of follow-up, he stopped attending the outpatient clinic.

Clinical presentation

Our patient, now at the age of 79, was referred to our general surgical outpatient clinic for a suspected painful right-sided inguinal hernia, present for 5 months. He was initially referred to the urology department because of a right-sided swollen testis, labelled as hydrocele. Our patient reported abdominal discomfort and diarrhoea; furthermore, he gained weight and had an increased abdominal circumference.

INVESTIGATIONS

Laboratory tests showed no major abnormalities; ESR was 25 mm/hour (normal range 1–7 mm/hour) and CEA 3 µg/L (normal <5 µg/L). He had chronic mild normocytic anaemia (haemoglobin level varied between 6.9 and 7.7 mmol/L (normal range 8.5–11.0 mmol/L)) existing for some years already and ascribed to his chronic diseases.

Ultrasonography of the scrotum confirmed a hydrocele with normal testes and epididymis, no torsion and no infection. Ultrasonography of the right inguinal region showed an incarcerated, but not strangulated, inguinal hernia with a defect diameter of 1.2 cm. Open surgical repair of the inguinal hernia was planned. During the procedure in the right inguinal region, a fixed solid subcutaneous swelling was found. A biopsy took place, whereupon the operation ended.

Pathological examination proved the mass to be recurrence of the peritoneal malignant mesothelioma. Microscopically, it showed to be a DPMM of the epithelioid type, showing infiltrating in stroma and fat (figure 1); immunohistochemically, the tumour was calretinin and CK7-positive, CK20-negative (figure 2).

PET-CT scan showed increased FDG uptake in the right inguinal region and diffuse peritoneal deposits. Ascites was present although not evident FDG-positive. The hydrocele could be explained to be a result of the ascites. Ultrasound-guided ascites puncture took place and showed morulae; there was glycogen present in groups and minimal atypia

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Figure 1 H&E stain, recurrent epithelioid mesothelioma infiltrating in stroma and fat.

Figure 2 Calretinin-positive mesothelial cells.

of nuclei. Immunohistochemically, the ascitic fluid was IHC calretinin-positive, CA125-positive, MOC-31 some positive cells, CEA-negative, TTF-1-negative, HMB-negative.

TREATMENT

Owing to extensive cardiac, renal and pulmonary comorbidity, hyperthermic intraperitoneal chemotherapy (HIPEC) was not considered as a treatment option in our patient. The palliative treatment strategy consisted of radiotherapy.

OUTCOME AND FOLLOW-UP

Our patient's general condition deteriorated and 1 year later, he died from a perforated sigmoid diverticulitis.

DISCUSSION

Most commonly, malignant mesothelioma originates from the pleura (70–80%); however, in ~20%, its origin is peritoneal. Very rarely, it originates from the pericardium, tunica vaginalis or hernial sac.^{1–6} DPMM clinically presenting as a hernia is extremely rare, there are only a few case reports written worldwide. Approximately 7% of patients with DPMM may develop hernias, most often inguinal or umbilical as a result of the increased abdominal pressure caused by ascitic fluid.^{5–7} The hydrocele in our patient was initially suspect for tunica vaginalis involvement, but additional examinations disproved this hypothesis and showed tumour localisation in the right inguinal region with hydrocele that was best explained as a result of the ascites.

The main risk factor for the development of DPMM is asbestos exposure.² Laboratory and radiological examinations are

mostly non-specific, as illustrated by this case. The diagnosis is based on pathological findings. DPMM has different histological subtypes; epithelioid being the most common.⁶

DPMM has a median survival of <1 year if left untreated.^{1–4} Palliative surgery and/or systemic chemotherapy prolongs the median survival up to 2 years.^{1–4–8} The management of DPMM has evolved to treatment including cytoreductive surgery (CRS) combined with HIPEC, extending the median survival up to 34–100 months.^{1–4–8–10} The recurrence-free survival of 8 years is remarkable, certainly when taking into consideration that this patient was not treated with the presently available and recommended combination of CRS and HIPEC. Our patient underwent (irradical) surgery and radiotherapy. Only one article reports of an even longer recurrence-free survival of 17 years; however, in that particular case, the patient was treated with chemotherapy.¹¹

Currently, there is no uniformly accepted staging system for malignant peritoneal mesothelioma, making it difficult to compare cases. Yan *et al*⁹ have proposed a novel tumour-node-metastasis system in 2011. A uniformly accepted staging system could help direct treatment and predict survival.

Liu *et al*¹⁰ studied survival of peritoneal mesotheliomas. In the literature, peritoneal mesothelioma is divided into benign and malignant. The benign group consisting of well-differentiated peritoneal mesothelioma (WDPM) and multicystic mesothelioma (MCM), both associated with good term survival.^{7–10} Liu *et al* classified the mesotheliomas as WDPM, MCM and DPMM of the epithelioid subtype. Invasion was characterised as absent (grade 0), into stroma (grade 1), into fat (grade 2) and into adjacent structures (grade 3). Peritoneal cancer index and completeness of cytoreduction were assessed surgically. Their study result was surprising; they did not find a survival difference between minimally invasive epithelioid mesotheliomas and indolent tumour variants like WDPM and MCM. Perhaps, the remarkably long recurrence-free survival in our patient is the result of a low malignant potential of the tumour, which initially showed expansion into fat but no evident stromal invasion.

In conclusion, this case of recurrence of malignant peritoneal mesothelioma is unique for its clinical presentation and recurrence-free survival. This case stresses the need for consensus on how to grade DPMM in order to accurately predict survival.

Learning points

- ▶ Mesothelioma is a rare neoplasm of the serosal membranes, most commonly, it originates from the pleura (70–80%); however, ~20% originates from the peritoneum.
- ▶ Malignant peritoneal mesothelioma can present as an inguinal hernia. Approximately 7% of patients with abdominal mesothelioma may develop hernia, most often inguinal or umbilical as a result of the increased abdominal pressure caused by ascitic fluid.
- ▶ Laboratory examination and radiology abnormalities are mostly non-specific. The diagnosis is based on pathological findings.
- ▶ Currently, there is no uniformly accepted staging system for malignant peritoneal mesothelioma, which makes it difficult to compare cases, direct treatment and predict survival.

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