Peritoneal mesothelioma in a case of inguinal hernia. A review of the Literature

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Abstract

The peritoneal mesothelioma (PM) is a rare, benign or malignant, primary tumour, arising from the peritoneal membrane. The most frequent histological form is the malignant one with an incidence of 2-2.6 new cases per million per year. The symptomatology is insidious and poses difficult problems in the diagnosis and the treatment. Instrumental diagnostic investigations are useful only in the diagnostic orientation. Only the pathologic examination allows to distinguish a peritoneal carcinomatosis from PM. The prognosis of MPM is pour. An intense multimodal therapy, combining surgery with CT and RT, increases the survival rates in the patients with MPM.
It has been proposed that hernia of abdominal wall play a role in the pathogenesis of this tumor. We believe that hypothesis seems unlikely considering the enormous discrepancy between the incidence of hernial pathology and PM.
Key words: Peritoneal mesothelioma, surgical treatment, inguinal hernia.

Riassunto

MESOTELIOMA PERITONEALE IN UN CASO DI ERNIA INGUINALE. REVIEW DELLA LETTERATURA

Il mesotelioma peritoneale (MP) è un tumore primitivo del peritoneo, benigno o maligno. La forma istologica più frequente è quella maligna, la cui incidenza si attesta sui 2-2.6 nuovi casi per milione di abitanti l'anno. La sintomatologia è insidiosa e rende difficoltosi la diagnosi ed il successivo trattamento. Gli esami diagnostico-strumentali sono utili solo per un orientamento diagnostico; solo l'esame patologico, infatti, permette di distinguere una carcinomatosi peritoneale da un MP. La prognosi del MPM è sfavorevole. Un'intensa terapia multimodale, che combini, cioè, la terapia chirurgica con la CT e la RT, aumenta le percentuali di sopravvivenza nei pazienti con MPM.
È stato proposto che l'ernia della parete addominale possa giocare un ruolo nella patogenesi di questo tumore. A nostro parere questa ipotesi è improbabile, tenuto conto dell'enorme discrepanza tra l'incidenza dell'ernia e quella del MP.
Parole chiave: Mesotelioma peritoneale, trattamento chirurgico, ernia inguinale.

Introduction

The mesothelioma is an uncommon, benign or malignant, primary tumour, arising from serous membranes, and exceptionally from the vaginal membrane of the testicle (43). The pleural form is the most frequent (60-80 per cent of the cases), while the peritoneal one represents 12-20 per cent of all the mesotheliomas (50, 1). In comparison to the pleural variety malignant peritoneal mesothelioma (MPM) has a more aggressive behaviour, involving intestinal obstruction and a progressive decline of the patient's general conditions (6).
The origin of the malignant mesotelioma has been connected to the exposure to the asbestos (48): it is estimated that the 70-80 per cent of MPM is attributable to the exposure to this mineral (7). The incidence of the malignant mesothelioma changes between different countries according to the duration and intensity of the exposure to the asbestos, especially in mines and industries. In a population not more exposed such as the United States, such incidence is equal to 1-2 new cases per million per year, while in populations more exposed like, Australia and Southern Africa, such incidence is attested to, respectively, as the 28.3 and 33 new cases per million per year (23).
The symptoms of MPM are insidious and do not allow an early diagnosis: frequently this tumour is in a stage too advanced for a radical treatment. The survival ori-

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ginally described by Moertel has not undergone meaningful improvements: the prognosis in fact is poor, with survival that still average around 6-12 months (34).

Clinical Case

D.M., male, 56 years old, was admitted to our department for a left inguinal hernia, which had appeared 4 years before. In his youth the patient worked for 7 years in the rubber industry; nevertheless, he was not certain to have been exposed to asbestos. Physical examination revealed, besides the aforesaid hernia, a globular abdomen, not tender to the superficial and deep palpation.
At surgical intervention of the hernia repair the sac contained omentum with ascitic fluid and three nodules that were removed and sent to the pathologist. Microscopic examination of the specimen revealed a peritoneal epithelial tubulopapillary mesothelioma (Fig. 1) and at immunohistochemistry the tumor was positive for CK, VIM, HBHE and negative for S100, LEU-M1, CEA (EMA +/-, CA125 +/-). The seroum carcinoembrionic antigen level was 3.8 ng/ml (normal, less than 5 ng/ml).
Chest Radiography did not show significant findings.
The abdominal US scan revealed the presence of ascites, liver moderately increased and two nodular hyperechoic lesions (1.3cm and 2.2 cm in size), near the porta hepatis.
Total body TC scan showed nothing to the chest, abundant ascites, spleen increased in size, two nodular lesions in the posterior abdominal wall near the liver, diffused thickening of mesenteric root, intestinal loops and greater omentum, and numerous lymphnodes (less than 1 cm in size) of the mesenteric root.
The patient refused cytoreductive surgery and was treated through chemotherapy with epirubicin and cisplatin (6 cycles in 6 months) that determined, to a TC scan performed 3 months after the beginning of the treatment, the disappearance of the ascites and the peritoneal and omental nodules. Eight months after a control with TC scan showed a peritoneal relapse and the patient underwent chemotherapy with mitomicin C (3 cycles in 3 months) without any result. Currently the patient is alive at 13 months from the beginning of the first chemotherapeutic treatment.

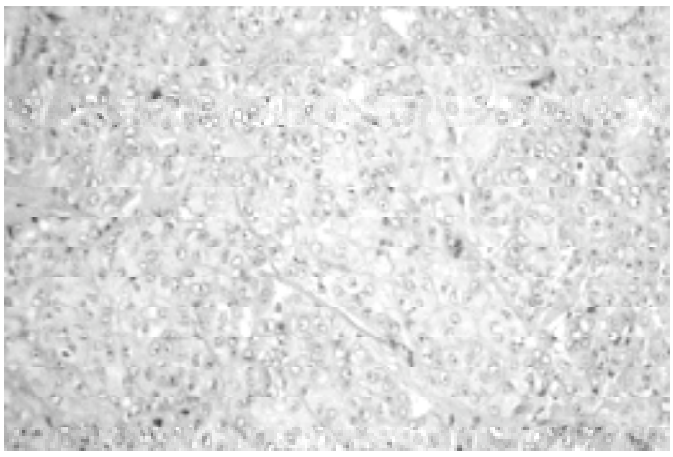

Fig. 1: Peritoneal tubulopapillary mesothelioma.

Discussion

Peritoneal mesothelioma (PM) can arise at any age, including children or in young adults (16), but at the diagnosis 70 per cent of the patients are 50-60 years old (27). In adults the MPM is often connected to the exposure to asbestos. It is reported that the asbestos causes chromosomal aberrations and phenotypic changes in mesothelial cells (25). Recently it has been hypothesized that the primitive mutation that would bring about the development of neoplastic clone is a translocation of the short arm of the chromosome 3. With the progression of the illness the neoplastic cells would be characterized by chromosomal patterns more and more complex (48).
Besides exposure to asbestos, other elements have been connected with PM development:
– abdominal radiotherapy (RT) (17);
– chronic or recurrent or tubercular peritonitis (33, 24, 37, 10);
– previous exposure to berill, zeolite, thorotrast (35);
– abdominal hernias.

Mirabella (31), in a Literature review, suggested that the association between PM and hernia of the abdominal wall does not seem casual. The development of hernia could be determined by ascites and increased endoabdominal pressure. Some Authors reported cases of mesothelioma of the hernial sac diffused to whole peritoneum after months or years (41, 18). Moreover, it was proposed that the mild but chronic inflammatory stimulus, realized in cases of hernia, would play an important part in the pathogenesis of this tumor (31). In our opinion this hypothesis seems unlikely considering the enormous discrepancy between the incidence of hernial pathology and mesotelioma.
The most frequent histological form of PM is MPM with an incidence of 2-2.6 new cases per million per year (15), but there exist also malignant borderline and malignant forms, of which the exact incidence is unknown, namely well-differentiated papillary mesothelioma of the peritoneum, multicystic peritoneal mesothelioma, adenomatoid peritoneal mesothelioma and localized fibrous tumour of the peritoneum (30).
MPM includes 3 histological types: epithelial, fibrous (or sarcomatous) and mixed (or biphasic) (51). The epithelial type is the most common form (75 per cent (41)) and can be tubulopapillary or solid. The mixed type represents 22 per cent and the fibrous type less than one-forth of MPM (13, 38). Well-differentiated papillary mesothelioma of the peritoneum is a tumour with good prognosis, painless, diagnosed accidentally mostly

in women in the fifth decade of life. It appears like nodules with variable size, localised o diffused, that can calcify and mime peritoneal ovarian metastasis (12, 43). The multicystic peritoneal mesotelioma can arise with abdominal pain and palpable mass, involves mainly the pelvis of female previously subjected to abdominal or pelvic surgery and is characterized by postoperative relapse in 45% of cases (43, 39).

The symptomatology of PM is not specific. The ascites is the most common symptom (90%): it is generally an transudate, abundant and relapsing (46), but it is a late sign because expression of advanced stage. From a primitive focus, in fact, the neoplastic cells spread to peritoneal sites of reabsorption, determining an increased production of ascitic fluid (45). Other possible symptoms are pain, nausea, vomit, fever, dyspnea, anorexia, marked weight loss and diarrhea. Occasionally the peritoneal mesothelioma can also present a palpable mass, an intestinal obstruction (46, 6).

Positive predictive factors of survival include a long duration of symptoms, absence of pain, epithelial histotypes, young age, good general conditions, response to chemotherapy (CT), wide surgery and surgery combined with the CT (14). A role has been attributed to CA-125 in the diagnosis and in the follow-up of the MP (8).

The diagnosis of PM can be set only by pathologic examination of specimens collected through laparotomic or laparoscopic surgery. The cytologic examination of ascitic liquid is useless because the single neoplastic cells are similar to mesothelial ones (47, 27). Instrumental diagnostic investigations are useful only in the diagnostic orientation. Nevertheless, sporadic cases of TC or US imaging-guided needle biopsy have been described in Literature (2, 36).

Double contrast barium enema radiograph is not specific but can address an extrinsic intestinal obstruction showing fixity, compression and dislocation of bowel loops (11).

US scan can detect ascites and nodular or diffused thickening of the peritoneum, mesentery and greater omentum (omental cake). Moreover it can assess lymphnodal and liver metastasis and the tumoral extension to the gastrointestinal tract (2, 21).

PM can have multiple aspect to the TC scan, which can be collected in two radiologic apparences: one with main mass, often in the upper abdomen, and intrabdominal spread nodules, the other one characterised by an endoabdominal solid desmoplastic effect, involving the bowel. However these findings are not specific to mesothelioma (32, 20). The differential diagnosis concerns essentially the peritoneal carcinomatosis and the PM. First it is important to investigate any previous exposure to the asbestos. In case of peritoneal carcinomatosis the TC scan is able to find the primitive tumour, concerning usually ovaria, colon and stomach in 50 per cent of cases (49). Findings of mesenteric infiltration are suggestive of mesothelioma in 55% of cases, whereas lymphnodal and liver metastases orient towards a diagnosis of adenocarcinoma (27).

Yeh (52) reported that US scan seems to be more accurate than TC scan showing a peritoneal masses and ascites, with the exception of obese patients. On the other hand Reuter (36) and Grust (19) reported that TC scan give more information than US scan because allows the chest exploration in order to seek signs of asbestosis and give a better all-round view in cases of voluminous abdominal mass, and reveal earlier peritoneal and mesenterial infiltration signs.

Magnetic Resonance Imaging, compared with the TC scan, does not supply further important information (21).

The optimal therapy for MPM has not been established. The role of surgery is often hindered by the advanced stage of the tumour, and studies about the chemotherapeutic treatment are limited by the rarity of this tumour. Surgery involves, in many cases, only sample biopsies for the pathologic diagnosis or cytoreduction of the tumoral mass in order to improve the successive therapeutic treatment. (1).

Some Authors, in fact, reported that patients undergoing cytoreductive surgery combined with CT or RT have much longer survival than ones treated with CT or RT alone (14, 26, 44, 5, 3, 40). Response to CT was reported using cisplatin (53, 29) and doxorobucin (42, 4). RT usually was used with intracavitary instillation of various agents or combined with CT.

Recently the intraperitoneal chemoperfusion has aroused particular interest in the treatment of mesothelioma because of this neoplasm tending to be confined on the peritoneal surface (28, 9).

Particularly the intraperitoneal chemoperfusion with cisplatin (22) has determined good rates of response and outcomes even more encouraging have been obtained using hyperthermic intraperitoneal chemoperfusion with cisplatin (46, 14, 9). Park and coll. (34) report an 80 per cent survival rate at 2 years in 18 patients with MPM treated through cytoreduction and continous peritoneal perfusion with cisplatin at 41°C eventually followed by a second-look surgery to remove completely any relapse of disease.

Conclusions

The PM is a rare neoplasm with elevated local aggressiveness that poses difficult problems in the diagnosis and in the treatment. In comparison with a single therapeutic modality, an intense multimodal therapy, combining surgery with CT and RT, increases the survival rates in the patients with MPM.

It has been proposed that hernia of abdominal wall play a role in the pathogenesis of this tumor. We believe that hypothesis seems unlikely considering the enormous discrepancy between the incidence of hernial pathology and PM.

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