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Case Report

Pathology Section

A Case Report of Primary Peritoneal Mesothelioma in a Male Patient

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ABSTRACT

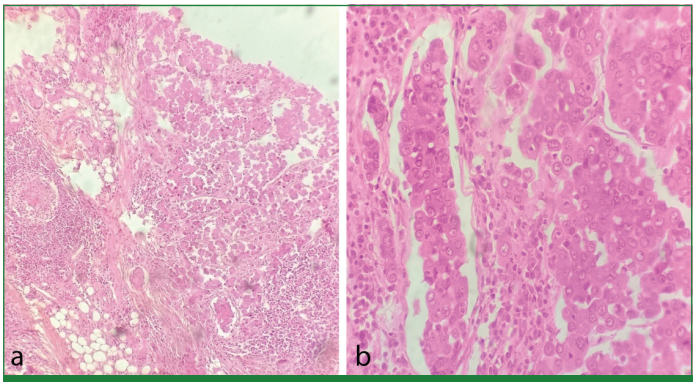
Mesothelioma is a malignant neoplasm arising from the mesothelial lining of serous cavities. Commonly arising from the pleura, this rare malignancy is strongly associated with asbestos exposure; however, origins from other sites, such as the tunica vaginalis of the testis, have also been reported in the literature. Hereby, the authors present a case of primary peritoneal mesothelioma in a 39-year-old male patient. The patient, a worker in the marble polishing industry, presented with metabolically active extensive mesenteric, peritoneal, and omental thickening involving the entire abdominal cavity, along with intra-abdominal lymphadenopathy, which was initially diagnosed as metastatic papillary adenocarcinoma based on an omental biopsy. No other metabolically active focus was detected on Positron Emmision Tomography (PET)-Computed Tomography (CT) elsewhere in the body. A review of the histopathology sections showed omental fatty tissue infiltrated by a neoplasm arranged predominantly in a papillary architecture, composed of cells showing a tendency toward dyscohesion. The neoplastic cells were round-oval, without overt nuclear pleomorphism, possessing small round nuclei with a single prominent nucleolus and a moderate amount of eosinophilic cytoplasm. Mitotic activity was inconspicuous. The tumour expressed Calretinin and WT1, leading to a final diagnosis of mesothelioma. Despite active management with intraperitoneal chemotherapy, the patient expired after three months.

Keywords: Eastern India, Neoplasm, Primary peritoneal malignancy

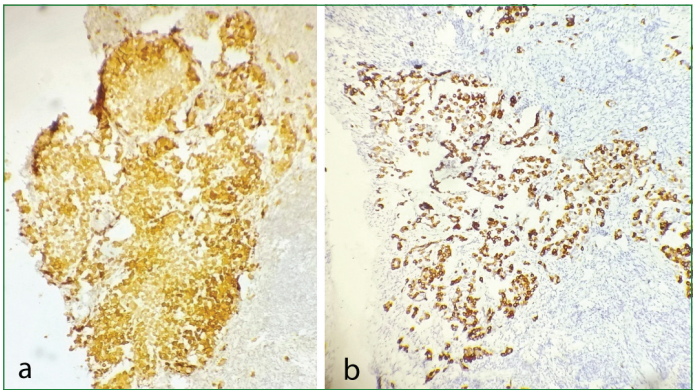
CASE REPORT

A 39-year-old male presented with generalised weakness and significant weight loss at a tertiary healthcare centre three months ago. He had been working in marble cutting and polishing for the last 20 years and had moved to a different state after the Coronavirus Disease 2019 (COVID-19) pandemic. There was no history of fever. The initial diagnostic work-up was conducted at the tertiary healthcare centre near his workplace. Upon examination, the patient displayed severe pallor, along with lumpiness and distension of the abdomen. The superficial lymph nodes were non palpable. An abdominal ultrasound revealed omental thickening with multiple echogenic shadows within. A chest X-ray was unremarkable. Ultimately, an omental biopsy was performed, which was reported as metastatic papillary adenocarcinoma. Following this diagnosis, the patient came to present hospital for definitive management. Investigations were initiated in accordance with the protocol for unknown primary tumours. A PET-CT was performed, and the histopathology slides were sent for Departmental review. The PET-CT findings revealed metabolically active extensive mesenteric, peritoneal, and omental thickening involving almost the entire abdominal and pelvic cavity. Additionally, multiple metabolically active anterior diaphragmatic, internal mammary, periportal, portocaval, peripancreatic, left para-aortic, and aorto-caval lymph nodes were noted. Asymmetrical wall thickening was observed involving the pyloric canal of the stomach, likely indicating a serosal deposit. Subsequently, an upper Gastrointestinal (GI) endoscopy was performed in search of a gastric primary, which was non contributory.

Meanwhile, the Institutional review was conducted, and based solely on histomorphology, a provisional report of metastatic adenocarcinoma was dispatched, although the morphological features were unusual. Sections showed omental fatty tissue infiltrated by a neoplasm arranged predominantly in a papillary architecture, composed of cells showing a tendency toward dyscohesion [Table/Fig-1,b]. The microscopic examination {Haematoxylin and Eosin (H&E)} shows neoplastic cells with round-oval, without overt nuclear pleomorphism, possessing small round nuclei with a single prominent nucleolus and a moderate amount of eosinophilic cytoplasm. Mitotic activity was inconspicuous. A primary panel of Immunohistochemistry (IHC) comprising Cytokeratin (CK), CK20, and calretinin was sought. CK7 and calretinin [Table/Fig-2a] were expressed by the tumour cells, whereas CK20 was negative. A secondary panel comprising WT1 [Table/Fig-2b], D2-40, and CK5/6 was then run, which showed expected positivity. A batch



[Table/Fig-1]: a) Photomicrograph shows omental fat infiltrated by papillary like structures of dyscohesive atypical cells (H&E, 100X); b) Photomicrograph shows neoplastic cells are relatively monomorphic, round-oval with single prominent nucleoli (H&E,400X).



[Table/Fig-2]: a) Strong diffuse expression (both nuclear and cytoplasmic) of Calretinin (IHC, 100X); b) Strong diffuse nuclear expression of WT1 (IHC, 100X).

of markers {Thyroid Transcription Factor (TTF 1), Paired Box Gene (PAX) 8, S-100, PSA, Hep Par 1, CDX2, CD34, Carcinoembryonic Antigen (CEA), MOC31} was also tested to exclude the remote possibility of a metastasis before rendering an unusual diagnosis. All of them returned negative results. Therefore, a final diagnosis of primary peritoneal mesothelioma was made. The patient was treated with Hyperthermic Intraperitoneal Chemotherapy (HIPEC) and systemic chemotherapy using pemetrexed and cisplatin for six cycles. However, the response was far below expectations, and the patient succumbed after four months of treatment.

DISCUSSION

Mesothelioma is a malignant neoplasm arising from the mesothelial lining of serous cavities. Its incidence varies by geographic location, with approximately 2,000 to 3,000 new cases diagnosed annually in the United States [1]. Commonly arising from the pleura, this rare malignancy is strongly associated with asbestos exposure; however, origins from other sites, such as the tunica vaginalis of the testis, have also been reported in the literature [2]. Here, author report a case of primary peritoneal mesothelioma in a 39-year-old male patient.

Peritoneal mesotheliomas are exceptionally rare and have a poor prognosis. Mesotheliomas (usually the more common ones originating from the lungs) occur predominantly in elderly patients, with a median age of 63 to 70 years [1]. The present patient presented at a relatively young age of 39 years, which is uncommon. A definite history of asbestos exposure was lacking; however, it should be noted that the patient was a long-term worker in the stone and tiles industry.

The diagnosis is essentially one of exclusion, often requiring a detailed clinical work-up and an exhaustive IHC panel to rule out other differential diagnosis [1]. Peritoneal carcinomatosis is relatively uncommon in men, whereas in females, ovarian serous carcinoma is a common cause. Primary gastric, colorectal, and appendiceal origins (including the pancreatico-biliary tract) should be investigated, especially in cases of pseudomyxoma peritonei. In present case, the closest differential diagnosis was primary peritoneal carcinoma; however, strong positivity for calretinin ruled this out. Kim J et al., reviewed cases of malignant peritoneal mesothelioma reported until 2017, and the same was done by Bridda A et al., in 2007 [1,2]. Diagnostic challenges, molecular pathways, and treatment options are nicely summarised by different authors [3-6]. Qin KR and Dua D, attempted to establish a link between asbestos exposure and the occurrence of this form of disease [7]. Incidence, survival analysis, and future perspectives of this rare disease are discussed by Ullah A et al., who analysed information from the Surveillance, Epidemiology, and End Results (SEER) database [8]. The case reported by Dusseault S et al., involved a 67-year-old patient with abdominal distension who underwent exploratory laparotomy when he developed features of small bowel obstruction [3]. Exploration revealed extensive peritoneal disease, which was later histologically diagnosed as epithelioid mesothelioma with rhabdoid differentiation. Unfortunately, before the administration of therapy, the patient deteriorated and expired. A few cases have been reported from this part of India. Saha A et al., reported a case in 2018 involving a 27-year-old woman, where no definite history of asbestos exposure was found [9]. The woman presented with a large abdominal mass, which was resected, and postsurgical follow-up for nine months was uneventful. Khushboo et al., reported a case involving a 24-year-old male with refractory haemorrhagic ascites in 2023 [10]. During exploration, multiple omental nodules were discovered, which were histologically confirmed as mesothelioma.

CONCLUSION(S)

Primary peritoneal mesothelioma is a rare cause of peritoneal carcinomatosis. The pathological understanding of this entity is still in its early stages. Reporting on this condition from different parts of the world is likely to enrich present knowledge regarding its behaviour and natural history, which may become instrumental in shaping appropriate therapeutic guidelines in the future.

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