CLINICAL CHALLENGE

Sister Mary Joseph’s nodule as the sole presenting sign of gastric signet ring cell adenocarcinoma

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Summary The Sister Mary Joseph’s nodule is a periumbilical metastatic tumor originating from advanced metastatic intra-abdominal and intrapelvic malignancies. It is an inconspicuous and uncommon clinical sign, which not only shows the presence of visceral malignancy but also reveals the poor prognosis of these malignancies. The majority of cases originate from gastrointestinal or ovarian cancer. We present a case of an 80-year-old woman with an umbilical nodule, which was the sole presenting symptom of advanced signet ring cell carcinoma of the stomach with generalized peritoneal carcinomatosis. There are very few cases of gastric signet ring cell adenocarcinoma presenting as a SMJN, a fact rather striking as signet ring cell gastric carcinoma has an increased frequency of peritoneal dissemination and carcinomatosis of the peritoneum.

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Introduction

The Sister Mary Joseph’s nodule (SMJN) is a periumbilical metastatic tumor originating from advanced metastatic intra-abdominal and intrapelvic malignancies [1—6]. It is an inconspicuous and uncommon clinical sign, which not only shows the presence of visceral malignancy but also reveals the poor prognosis of these malignancies [1—3]. The majority of cases originate from gastrointestinal or ovarian cancer.

The term SMJN was first used by Sir Hamilton Bailey in his book Physical Signs in Clinical Surgery, in honor of Sister Mary Joseph, who worked as a surgical assistant of Dr. William Mayo at St. Mary’s Hospital. She was the first to notice the relation between umbilical nodules and intra-abdominal malignancies [1,3,4].

We present a case of an 80-year-old woman with an umbilical nodule, which was the sole presenting symptom of advanced signet ring cell carcinoma of the stomach with generalized peritoneal carcinomatosis. There are very few cases of gastric signet ring cell adenocarcinoma presenting as a SMJN [7,8,9], a fact rather striking as signet ring cell gastric carcinoma has an increased frequency of peritoneal dissemination and carcinomatosis of the peritoneum [10].

Case report

An 80-year-old woman presented with a 3 cm in diameter umbilical nodule. The patient was unaware regarding

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the duration of the lesion. The patient’s medical history included arterial hypertension, for which she received flunarizine 5 mg once per day and telmisartan 20 mg twice per day, and vertigo. Physical examination revealed a female in good general condition with a painless, firm, indurated subcutaneous umbilical nodule. Laboratory examination showed a normocytic anemia with a 32.7% Ht and 10.9 g/dl hemoglobin and a mild leukocytosis with a WBC count of 13,000 × 10⁶/ml (45.7% neutrophils, 46.4 lymphocytes). All other blood chemistry were within in the normal range.

The nodule was surgically excised under local anesthesia. The histopathological examination revealed extensive, almost total infiltration of the nodule from a low differentiation adenocarcinoma with signet and mucus production. The cells formed groups and islets and rarely granular-like formations within a fibrous connective substrate. The neoplastic cells were large, with irregular or round boundaries, eosinophilic or translucent cytoplasm, large, irregular nuclei with extended nuclear pleomorphism and atypia and increased mitotic activity. There were also signet ring cells and extracellular mucous production. Immunohistochemical staining revealed positivity for CAM 5.2 (CK 8/18), AE1/AE3 and CK7 while the cells were negative for CK20 and ER (Fig. 1).

The abdominal CT scan revealed thickening of the gastric wall at the pylorus and the presence of a pathologic mass with soft tissue density. Also, it showed the presence of a hypodense mass in the posterior edge of the spleen, ascitic fluid in the perihepatic, perisplenic and paracolic space and infiltration of the peritoneal fat and thickening of the peritoneal folds (Fig. 2). The findings indicated gastric cancer with peritoneal carcinomatosis. The gastroscopy revealed infiltration of the lesser curvature of the stomach by a neoplasm and the biopsies confirmed the presence of a poorly differentiated diffuse type adenocarcinoma with signet ring cells (Fig. 3).

![Figure 1](image)

A. Within the panniculus adiposus, infiltration from a low differentiation adenocarcinoma is observed (H&E × 100). B. Adenocarcinoma with extracellular mucus production (H&E × 400). C. Signet ring cells with intracellular mucus production. D–F. The neoplastic cells were positive for CK 8/18 (D × 100), AE1/AE3 (E × 200) and CK7 (F × 200).
The patient received only palliative treatment and died 5 months later.

Discussion

A palpable umbilical mass may be the first clinical sign of an underlying advanced intra-abdominal or intrapelvic malignancy [1,4]. In the majority of cases of SMJN there are symptoms suggestive of internal malignancy while in 15–45% of cases SMJN is the first and only sign, as in the present case [1,2]. SMJN may occur as a dermal, subcutaneous or peritoneal deposit [4]. It usually presents as hard, irregular, white, violet or red umbilical nodule of variable size, most often less than 5 cm in diameter but may reach up to 10 cm [1,11]. Although, mainly painless, it may be occasionally painful with the overlying skin ulcerated, fissured or even necrotic [1,4,11]. Sometimes, rather than an actual node there may be only thickening and inflammation or there may be an abscess underlying the tumor [1,2,4,11].

Most umbilical tumors are metastatic while primary neoplasms are extremely rare. In most cases the umbilical neoplasm, either metastatic or primary, is an adenocarcinoma followed by epidermoid (squamous cell) carcinoma, undifferentiated malignant tumors and carcinoids [1,4,11]. The commonest origins are the stomach and colon in males and the ovaries in females [1,2]. Other primary sites include the cecum, small intestine, pancreas, gall bladder, kidney, fallopian tube, cervix, endometrium, breast and rarely lung, prostate, Meckel’s diverticulum and primary ceros carcinoma of the peritoneum while in some cases the site of origin remains unknown [1,2,11]. In general, umbilical metastasis of visceral malignancies is rare and occurs in 1–3% of cases [2,7].

The possible routes of the umbilical metastasis include:

1) direct invasion, through continuous extension, of the anterior peritoneum;
2) lymphatic spread via the axillary, inguinal, para-aortic, internal mammary and external iliac lymph nodes;
3) hematogenous spread through arterial and venous seeding;
4) direct extension along the embryonic ligaments.

In our case CT scan revealed infiltration of the peritoneal fat and thickening of the peritoneal folds indicating invasion of the peritoneum.

The diagnosis of SMJN is based on histopathologic evaluation because of the large number of possible differential diagnoses [1]. The differential diagnosis of an umbilical nodule includes metastasis, umbilical hernia, hypertrophic scar, endometriosis, pyogenic granuloma, lymphangioma, pilonidal sinus and primary carcinoma [2,4].

SMJN is generally associated with poor prognosis. Median survival time for patients receiving palliative therapy has been reported to range from 2.3 to 11 months [2,3,5,6]. Some studies show that survival can be expanded to approximately 17.6 months with chemotherapy [5]. Management remains controversial with some advocating aggressive treatment including surgery, chemotherapy and radiotherapy while others recommend palliative treatment [2,5].

In conclusion, an umbilical nodule may be the first sign of a malignant disease and biopsy of all nodular lesions of the umbilicus should be performed.
Conflict of interest statement

No potential conflict of interest relevant to this article was reported.

References