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Metachronous Pancreatic and Thyroid Metastases from Primary Soft-Tissue Myoepithelioma in the Clavicular Region: A Case Report of a Long-Term Survivor

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Male, 69-year-old
Final Diagnosis: Metachronous pancreatic and thyroid metastases from primary soft tissue myoepithelioma
Symptoms: None
Medication: —
Clinical Procedure: Surgery
Specialty: Surgery

Objective: Rare disease
Background: Myoepithelioma is a rare neoplasm that differentiates toward myoepithelial cells. This condition mainly occurs in the salivary gland and rarely in the soft tissue or internal organs. Long-term survival with repeated multiple rounds of resection for recurrence is rarely reported.

Case Report: A 69-year-old man was diagnosed with metachronous pancreatic and thyroid metastases from myoepithelioma, which initially originated from a resected soft-tissue lesion in the left clavicular region in 2007. In addition, a locally recurrent lesion was resected and the patient received brachytherapy in 2015. Moreover, a metachronous metastatic lesion in the right lung was resected in 2017. Histopathological examination confirmed that all lesions were myoepithelioma. In the present case, pancreatoduodenectomy and right hemithyroidectomy for both metastatic lesions were successfully performed. Histopathology revealed small round-to-spindle-shaped tumor cells with atypia, proliferating in reticular formation, accompanied by myxoid stroma with chondromyxoid and hyalinized stroma, and the histology was similar to that observed in the previous specimen. Immunohistochemistry revealed positivity for cytokeratin (AE1/AE3), glial fibrillary acidic protein, vimentin, and S-100, and confirmed the diagnosis of myoepithelioma. To the best of our knowledge, this is the first study presenting a long-term survivor of soft-tissue myoepithelioma who underwent repeated multiple rounds of resection for recurrence in various organs.

Conclusions: We reported the case of a long-term survivor of soft-tissue myoepithelioma requiring multiple rounds of surgical resection for local recurrence and metachronous metastases in the lung, pancreas, and thyroid. When managed appropriately, some patients might benefit in terms of survival from repeated resection of recurrent lesions.

MeSH Keywords: Myoepithelioma • Neoplasm Metastasis • Pancreatoduodenectomy • Survivors • Thyroidectomy

Abbreviations: CK – cytokeratin; CT – computed tomography; GFAP – glial fibrillary acidic protein; PET – positron emission tomography

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/920702>



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Background

Myoepithelioma is a rare tumor that mainly occurs in the salivary gland and rarely in the soft tissues and internal organs. In the current case, the patient presented with metachronous metastases to the pancreas and thyroid. The clinical outcome of myoepithelioma ranges from benign to malignant conditions; however, distinct criteria for malignant myoepithelioma have not been established. Long-term survival with multiple rounds of resection for recurrent lesions has not been reported to date. Herein, we report the case of a long-term survivor and conduct a literature review.

Case Report

A 69-year-old man was diagnosed with soft-tissue myoepithelioma in the left clavicular region, which was resected with wide margin in 2007. Histopathology results revealed small round-to-spindle-shaped tumor cells, with high nucleus-to-cytosol ratio, proliferating in reticular formation, accompanied by myxoid, chondromyxoid, and hyalinized stroma (Figure 1). Immunohistochemistry revealed positivity for cytokeratin (CK) (AE1/AE3), glial fibrillary acidic protein (GFAP), vimentin, and S-100, thereby confirming the diagnosis of myoepithelioma.

During follow-up in 2015, a locally recurrent lesion was observed and resected, and the patient received brachytherapy. In 2017, a chest computed tomography (CT) scan revealed 2 nodules measuring 11 mm and 5 mm at the right S10 region. Partial pneumonectomy in the 2 pulmonary regions confirmed metastases of myoepithelioma, with histology similar to that observed in the specimen previously resected. In 2019, a follow-up CT scan revealed new masses in the pancreatic head and right lobe of the thyroid gland, both showing an enhanced uptake, detected by positron emission tomography (PET) scan. Thus, metachronous metastasis of myoepithelioma was highly suspected (Figure 2). Moreover, his past medical history revealed primary prostatic cancer resected in 2018.

The patient was asymptomatic. His height was 172 cm and weight was 65 kg. His vital signs were as follows: blood pressure 133/77 mmHg, heart rate 74 beats/min, and body temperature 36.0°C. The patient's abdomen was soft and flat with no tenderness. Laboratory results showed an elevated gamma-glutamyl transferase level of 68 IU/L and a low cholinesterase level of 222 U/L. Other serum chemistry test and complete blood count results were normal, and the serum tumor marker levels (carbohydrate antigen 19-9 [CA 19-9], carcinoembryonic antigen [CEA], and prostate-specific antigen) were within normal range.

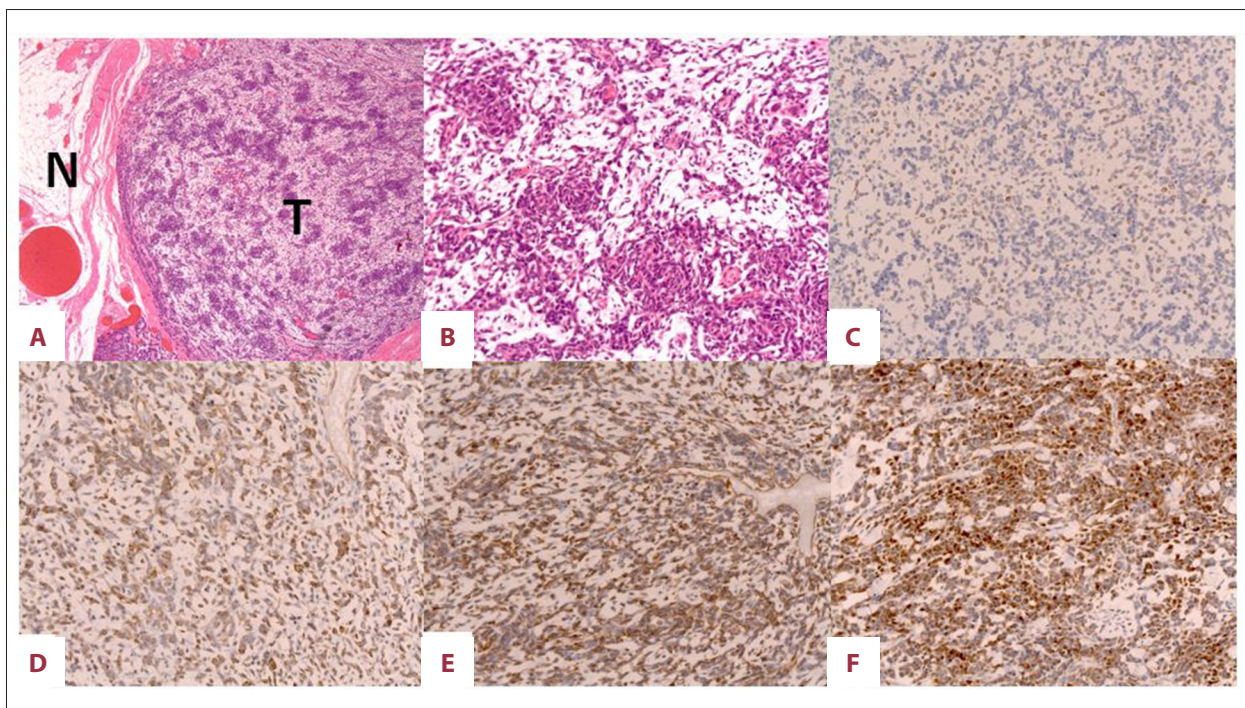


Figure 1. Histopathological findings of the initial surgery for soft-tissue myoepithelioma in the left clavicular region. Small, round-to-spindle-shaped tumor cells with high nucleus-to-cytosol ratio proliferating in a reticular formation accompanied by myxoid stroma with chondromyxoid and hyalinized stroma (hematoxylin and eosin staining: (A) $\times 20$, (B) $\times 100$). Immunohistochemistry findings revealed positivity for cytokeratin (AE1/AE3) (C), glial fibrillary acidic protein (D), vimentin (E), and S-100 (F). N – normal tissue; T – tumor.

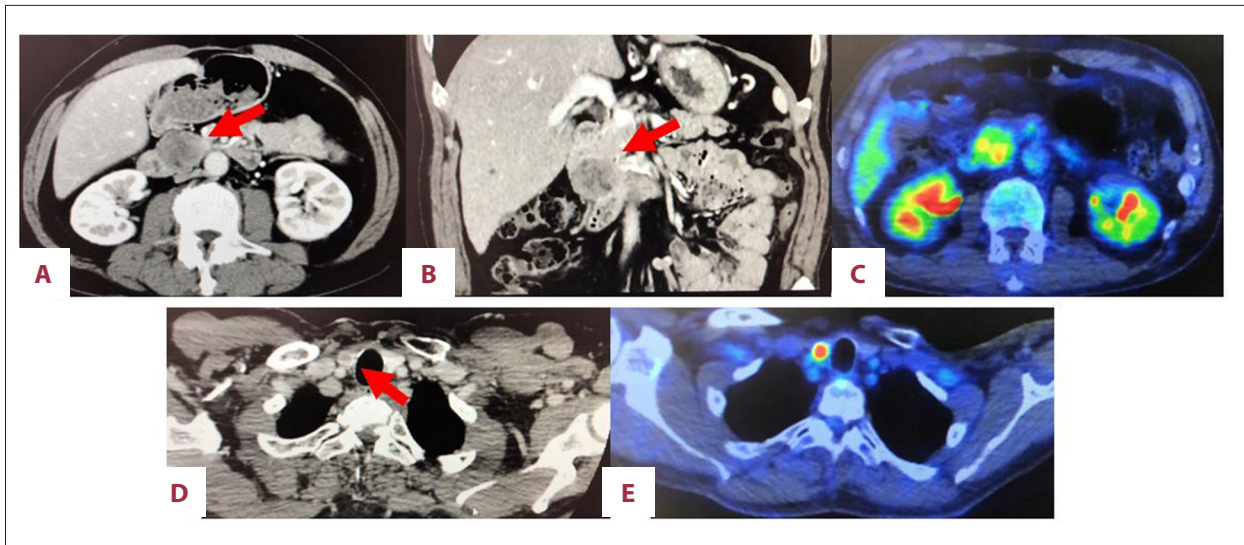


Figure 2. Computed tomography and positron emission tomography (PET) scan images showing a well-circumscribed lesion in the pancreatic head with a maximum diameter of 35 mm. No dilatation of the main pancreatic duct nor the biliary duct was observed. Axial (A) and coronal (B) images. A low-density mass in the right lobe of the thyroid gland measuring 10 mm was observed (D). Both lesions had an enhanced uptake on PET scan (C, E).

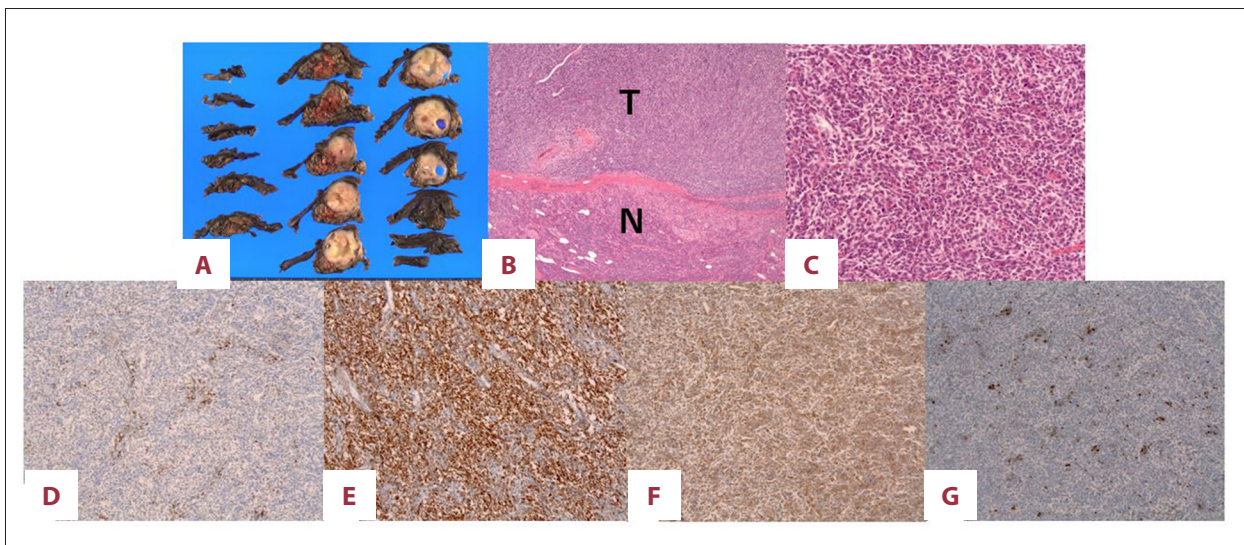


Figure 3. Resected specimen of the pancreatic lesion. Macroscopically, a well-margined, whitish lesion measuring 32×29×30 mm was observed (A). The histopathology was similar to that observed in the specimen of soft-tissue myoepithelioma (Figure 1) (hematoxylin and eosin staining: (B) ×20, (C) ×100). Immunohistochemistry results revealed focal positivity for cytokeratin (AE1/AE3) (D) and S-100 (G) and diffuse positivity for glial fibrillary acidic protein (E) and vimentin (F). N – normal tissue; T – tumor.

An abdominal contrast-enhanced CT scan revealed a well-circumscribed lesion in the pancreatic head, which measured 35×33×30 mm, and the lesion showed gradual enhancement on dynamic study, which was not indicative of pancreatic cancer. Dilatation of the main pancreatic duct or the biliary duct was not observed. Moreover, a low-density mass in the right lobe of the thyroid gland, which measured 10×10×10 mm, was detected (Figure 2). Neither of these lesions had been observed

previously. No intrapelvic lesion was observed during robot-assisted prostatectomy. To confirm the diagnosis, endoscopic ultrasound-guided fine-needle aspiration of the pancreatic lesion and fine-needle aspiration of the thyroid lesion were performed. The results were similar to those of the previously resected specimen of the myoepithelioma. Thus, the patient presented with metachronous metastases to both organs preoperatively. For the thyroid lesion, right hemithyroidectomy was performed and

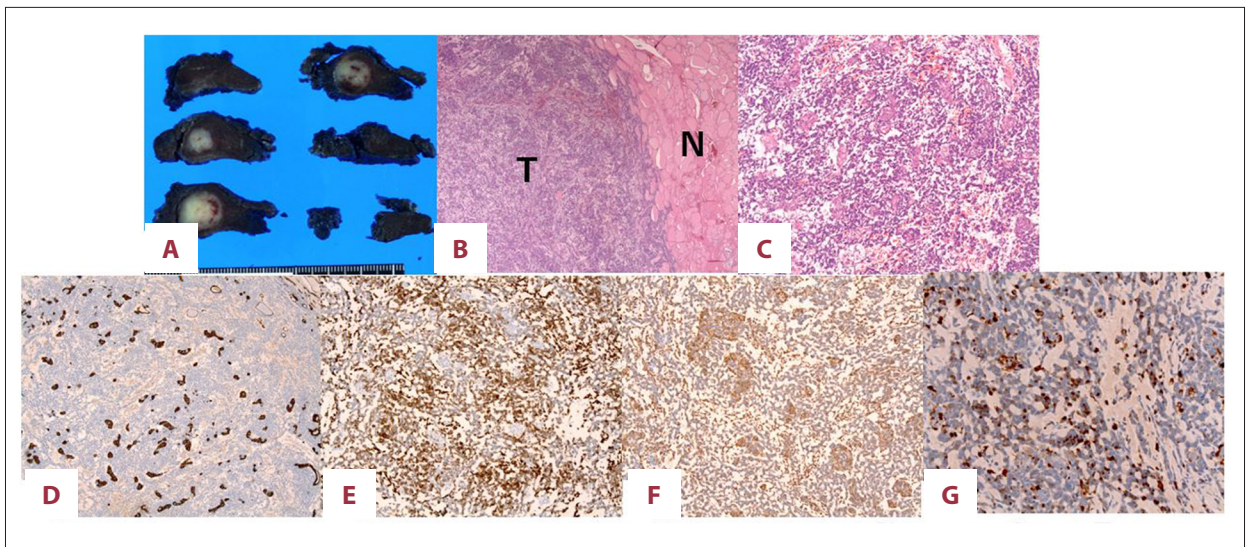


Figure 4. Resected specimen of the thyroid lesion. Macroscopically, a well-margined, whitish lesion measuring 57×35×18 mm was observed (A). The histopathology was similar to that observed in the specimen of soft-tissue myoepithelioma (Figure 1) (hematoxylin and eosin staining: (B) ×20, (C) ×100). Immunohistochemistry results revealed focal positivity for cytokeratin (AE1/AE3) (D) and diffuse positivity for glial fibrillary acidic protein (E), vimentin (F), and S-100 (G). N – normal tissue; T – tumor.

no complications were observed. In addition, for the pancreatic lesion, pancreatoduodenectomy was successfully performed. Intraoperatively, intraperitoneal dissemination and ascites were not observed, and the intrapelvic state was compatible with postprostatectomy. Reconstruction was achieved via biliary gastric anastomosis from the mouth to the anus using the antecolic route. The pancreatic route was created via pancreatico-enteric anastomosis. The postoperative course was uneventful, and the patient was discharged on the 21st postoperative day.

Macroscopically, a well-margined whitish lesion measuring 32×29×30 mm was found (Figure 3). Histopathology results revealed that the lesion had a distinct capsule formation and consisted of tumor cells with round, oval, and spindle-shaped nuclei, with proliferation in a sheet-like, trabecular, and network formation accompanied by myxoid stroma (Figure 3). Immunohistochemistry results were focally positive for CK (AE1/AE3) and S-100 and diffusely positive for vimentin and GFAP. This result was similar to the resected specimen of the primary soft-tissue myoepithelioma (Figure 1). Similar findings were observed in the resected thyroid lesion (Figure 4). The resection margins for both lesions were confirmed to be tumor-free. The final diagnosis of metachronous metastases to the pancreas and thyroid was confirmed. The patient has had no new detectable lesion to date, and no additional treatment was provided.

Discussion

Myoepithelial tumors are rare and originate from myoepithelial cells. These cells have the characteristics of both epithelial

and smooth muscle cells, which reside between the acinus or glandular epithelial cells and basement membrane as part of the exocrine glands, such as the salivary gland, mammary gland, sweat gland, and bronchial gland. Their function is to release secretory substances by constricting themselves [1].

Myoepithelioma is a tumor that differentiates toward myoepithelial cells, which are mostly found in the salivary gland [2,3]. Similar to their salivary gland counterparts, myoepithelial tumors of soft tissues are rare and have heterogeneous morphologic and immunophenotypic features [3]. Soft-tissue myoepithelioma occurs mostly in the extremities, and this type of tumor originates from the head and neck, skin, internal organs, and bones [4].

Assessment of symptoms, laboratory examination, and imaging studies yields inadequate findings. Hence, histopathological examination is required for the diagnosis of such a condition.

The histopathology of myoepithelioma is morphologically heterogeneous. Classically, myoepithelioma comprises spindle or ovoid myoepithelial cells, having cytoplasm with an eosinophilic-to-clear appearance and nuclei with minimal atypia proliferating mainly in trabecular or reticular formation accompanied by hyalinized-to-myxoid stroma [5,6]. When signs of malignancy, such as cellular atypia with vesicular nuclei and prominent nucleoli, are observed, myoepithelial carcinoma is considered [7,8]. Currently, clinical or pathological factors that can be used to predict clinically aggressive behavior have not been identified. A high index of mitosis and necrosis may indicate myoepithelial carcinoma; however, cytological atypia is

the most reliable prognostic parameter [5]. In relation to this, the patient in the current report only presented with cytological atypia with round, oval, and spindle nuclei. The rate of mitosis was low, and no apparent necrotic area was observed, indicating that these morphologic changes are not always correlated with clinically malignant behavior.

No criteria for immunohistochemistry results have been established to date. The most widely observed combination of markers for myoepithelioma are the co-expression of CK or epithelial membrane antigen (EMA) and S-100 protein or myocyte marker [5]. By analyzing 101 cases of soft-tissue myoepithelial tumors, Hornick found the percentage positivity for each of the following antigens: CK (AE1/AE3 or PAN-K), 93%; S-100, 87%; calponin, 86%; EMA, 63%; GFAP, 46%; smooth muscle actin, 36%; p63, 23%; and desmin, 14% [5]. Although the specificity of these markers is low, they are still commonly used. Hence, the combined use of hematoxylin and eosin staining and immunohistochemistry are required to make the definitive diagnosis.

Although most cases of myoepithelioma are benign, some recur locally [9] or metastasize to other organs, such as the lung, liver, and brain [10]. However, metastasis to the pancreas and thyroid has not been reported. Previous studies have revealed an average metastatic rate of 47% and mortality rate of 29%, 32 months after diagnosis of myoepithelial carcinoma [11].

The treatment strategy is mainly wide surgical resection with clear margin. The efficacy of chemotherapy and radiation therapy has been assessed, but studies reported contrasting results. Currently, surgical resection is the most commonly recommended treatment option [11–13].

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In a recent systematic review of soft-tissue myoepithelioma including 10 studies with a total of 233 patients, surgery was performed in most cases; however, R0 resection was achieved in only 24–78% [6]. With the high local recurrence and distant metastasis rates (17–50% and 8–48% respectively), the authors concluded that surgical resection might be sub-optimal [6].

Our review of the literature produced 3 important findings. First, to the best of our knowledge, metastases to the pancreas and thyroid have never been previously reported. Second, the dormant state reaches a maximum of 8 years. Third, long-term survival is achieved by multiple rounds of surgical resection. Since there is a long-term survivor of metastatic myoepithelial tumor, with a mortality rate of 83% [14], our case may be stratified according to clinically manageable subgroups of myoepithelioma with malignancy, and similar cases should be assessed in future studies.

Conclusions

We reported the case of a long-term survivor of soft-tissue myoepithelioma requiring multiple rounds of surgical resection for its local recurrence and metachronous metastases to the lung, pancreas, and thyroid. Although the histopathological findings revealed that the lesion was benign, the clinical behavior showed malignancy. Our case shows that metachronous metastatic myoepithelioma can be effectively managed with multiple rounds of resection, and this can result in long-term survival.

Conflict of interests

None.