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METASTASIS OF ADENOID CYSTIC CARCINOMA TO THE KIDNEY: A CASE REPORT

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ABSTRACT

Adenoid cystic carcinoma (AdCC) is a malignant salivary gland tumor with slow growth, but it has the potential for recurrence and distant metastasis. Metastasis to the kidney is very rarely reported.This study report a rare case of AdCC metastasis from the parotid gland to the left kidney with aim to provide clinical, radiological, and histopathological descriptions and emphasize the importance of differential diagnosis with primary renal cell carcinoma. A case study of a 42-year-old male patient with a left kidney mass who had a history of parotid AdCC one year earlier. Histopathological examination was performed after radical surgery. Histopathology showed a cribriform and lobulated pattern with epithelial and myoepithelial cell populations within a myxoid stroma, typical of AdCC. No perineural or vascular invasion was found. Although extremely rare, AdCC can metastasize to the kidney. Diagnosis requires comprehensive evaluation and a multidisciplinary approach.

Keywords: Adenoid cystic carcinoma, metastasis, kidney, histopathology

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1. Introduction

Adenoid Cystic Carcinoma (AdCC) is a relatively rare malignant tumor of the salivary glands (Kristensen et al. 2023). AdCC is characterized by slow growth, perineural invasion, and a tendency for recurrence and metastasis (Chae et al. 2015). Histopathologically, AdCC is classified into three main subtypes based on the solid component of the tumor: cribriform, tubular, and solid (Kristensen et al. 2023). The solid subtype is generally associated with a worse prognosis compared to the cribriform and tubular subtypes, which tend to show a slower clinical course (Kristensen et al. 2023). This tumor typically consists of two distinct cell types: inner luminal epithelial cells and outer myoepithelial cells (Chae et al. 2015).

AdCC has a tendency for recurrence and distant metastasis, most commonly involving the lungs, followed by smaller fractions affecting bones, liver, and brain (Kristensen et al. 2023; Wu et al. 2015). Metastasis of AdCC to the kidney is reported to be extremely rare (Chae et al. 2015; Wu et al. 2015). Patients with parotid gland AdCC who experience recurrence and/or metastasis have an overall survival rate of approximately 40% over 10 years (Liu et al. 2017). Due to the long-term risk of recurrence and metastasis, often occurring years after primary treatment, long-term follow-up is crucial for patients diagnosed with AdCC (Feki et al., 2021). As a rare example of kidney metastasis, Qiu et al. (2014) reported a case of solitary metastasis of AdCC from the submandibular gland to the right kidney detected three years after surgery for the primary tumor (Qiu et al. 2014). In this report, we describe a case of left renal metastasis in a patient with a history of parotid AdCC one year prior.

2. Methods

A 42-year-old male presented to the hospital complaining of left flank pain. Abdominal Multislice Computed Tomography (MSCT) showed an enlarged left kidney with a heterogeneous, well-defined, contrast-enhancing mass without crossing the claw sign, suggestive of a stage I left renal mass. The right kidney appeared normal on MSCT imaging **(Figure 1)**. Laboratory results showed normal urea (21 mg/dL) and creatinine levels (0.91 mg/dL). The patient had a history of a parotid tumor in 2023 diagnosed as parotid AdCC. A radical ureteronephrectomy was performed to remove the left renal mass. The excised tissue was placed in a container with 10% buffered formalin for histopathological examination.

Figure 1. Abdomen MSCT showed an enlarged left kidney (yellow arrow).

Macroscopic examination of the renal tissue revealed a size of 18 x 10 x 12 cm. The cut surface showed a solid, whitish, firm tumor partially cystic, with areas of normal renal tissue remaining at the edges. Microscopic examination using hematoxylin-eosin (H.E.) staining of the left kidney tissue showed tumor nests composed of both solid and lobulated cribriform structures forming macrocystic and microcystic patterns with abundant cytoplasm showing basaloid features within a broad myxoid stroma. Tumor cells exhibited atypical nuclei, pleomorphism, hyperchromasia, and prominent nucleoli. Some parts of the tumor showed well-defined borders. No lymphovascular space invasion (LVSI negative) or perineural invasion was observed. Normal tubules and glomeruli were still visible **(Figure 2.A-B).**

Figure 2. Hematoxylin-eosin staining of the adenoid cystic carcinoma in the left kidney. A) Tumor (Red Arrow) and normal glomeruli (Head arrow), magnification, x100 and x400. B) Tumor with solid growth pattern.

3. Discussion

Adenoid cystic carcinoma (AdCC) is a relatively rare epithelial malignancy (Liu et al. 2017). It most commonly occurs in major and minor salivary glands and shows infiltrative growth with perineural invasion (Liu et al. 2017).

Histopathologically, AdCC is classified into three main subtypes based on its solid growth pattern: cribriform, tubular, and solid (Chae et al. 2015). Cribriform and tubular subtypes generally show a slower clinical course, while the solid subtype is associated with a poorer prognosis and higher recurrence frequency (Chae et al. 2015). AdCC is also known for its slow progression but tendency for local recurrence and distant metastasis years after therapy.

AdCC tends to metastasize via hematogenous spread or perineural invasion, most frequently to the lungs, followed by bones, liver, and brain (Feki et al. 2021; Liu et al. 2017). Renal metastasis of AdCC is rarely reported in literature (Kristensen et al. 2023; Liu et al. 2017). In cases of renal metastasis, radiological findings can vary and sometimes resemble primary renal cell carcinoma (RCC), making diagnosis difficult (Kristensen et al. 2023; Qiu et al. 2014). Histopathologically, metastatic lesions in the kidney show morphology similar to the primary tumor, exhibiting cribriform, tubular, or solid growth patterns with the two characteristic cell populations of AdCC (Liu et al. 2017). In pathology practice, renal metastases often present as a single unilateral mass, potentially misleading the initial diagnosis as a primary kidney tumor (Wu et al. 2015).

In this case, the tumor showed a cribriform and lobulated growth pattern consisting of luminal epithelial and myoepithelial cells within a myxoid stroma, consistent with AdCC interspersed with normal renal cells. Metastasis was confirmed due to the patient's history of parotid AdCC one year earlier and the location of metastasis in the kidney. Immunohistochemical examinations such as C-Kit (CD117) or CK7 may be used for further confirmation (Chae et al. 2015; Liu et al. 2017). However, in this case report, it was deemed unnecessary since the patient had a known history of parotid AdCC, the lesion was unilateral in the kidney typical of metastatic cases, and histopathological findings clearly showed AdCC morphology.

4. Conclussion

The prognosis of AdCC is influenced by several factors, including histological subtype, with the solid subtype often associated with a poorer outcome (Chae et al. 2015)This case of AdCC metastasis highlights the importance of long-term monitoring to detect recurrence or metastasis, even in uncommon organs like the kidney. Multidisciplinary evaluation (radiology, pathology, and clinical) and immunohistochemical testing (if needed) are key to accurate diagnosis and appropriate management.

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CONFLICT OF INTEREST

All authors declare that there is no conflict of interest.

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Figure 1.


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Figure 2.A

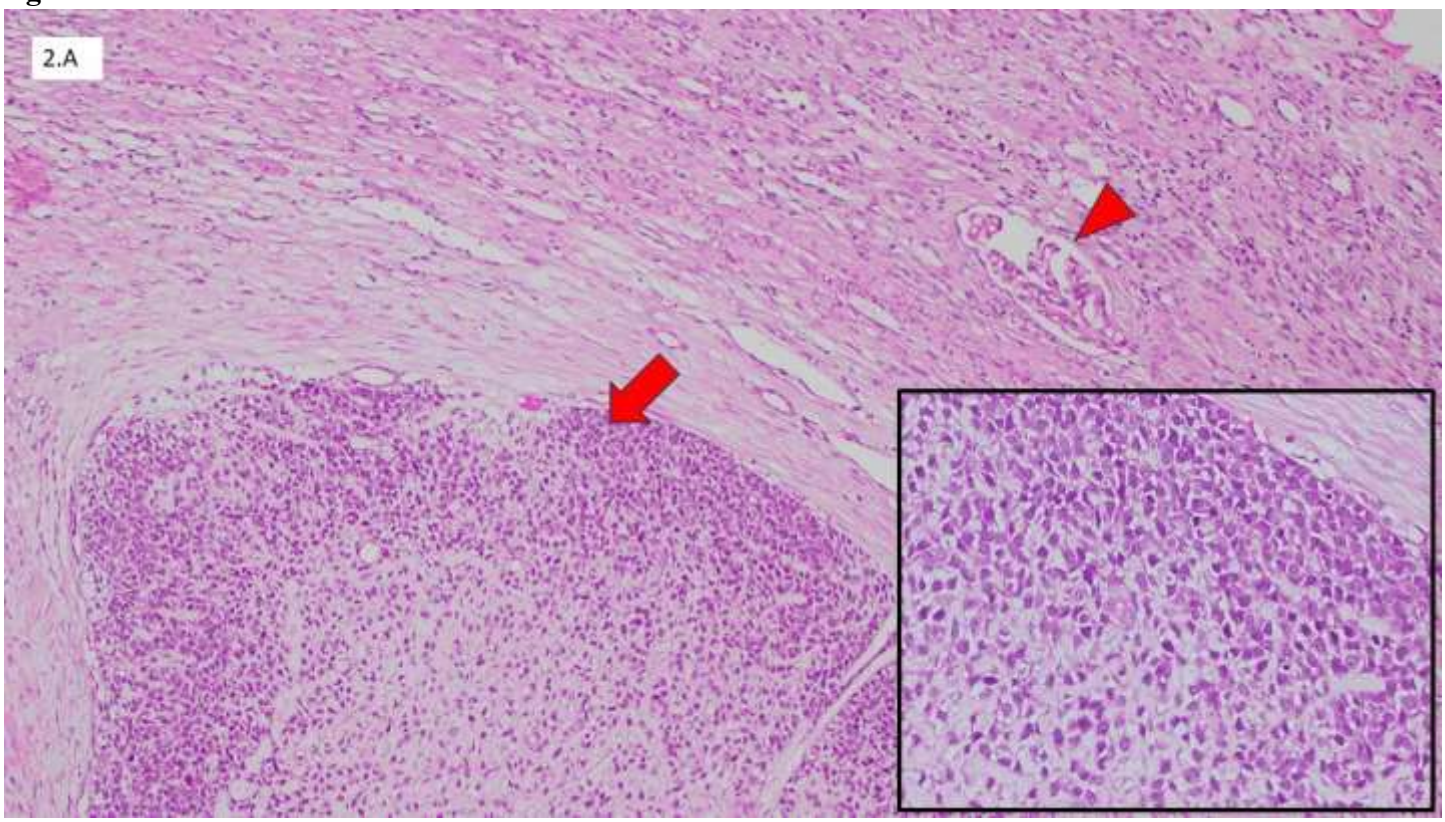

Figure 2.B