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Skull Metastasis from Advanced Distal Sigmoid Adenocarcinoma: A Rare Presentation

Jaganiswaran Bani [1]*, Rahmat Haron[2], Norfarizan Azmi[3], Islah Munjih[4]

[1]Department of Neurosurgery, Hospital Tuanku Ja'afar Seremban, Negeri Sembilan, Malaysia
[2]Department of Surgery, Colorectal Unit, Hospital Tuanku Ja'afar Seremban, Negeri Sembilan, Malaysia
[3]Department of Surgery, Kulliyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[4]Department of Surgery, Sultan Ahmad Shah Medical Centre @ IIUM, Kuantan, Pahang, Malaysia

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***Corresponding author:** Jaganiswaran Bani
Department of Neurosurgery, Hospital Tuanku Ja'afar Seremban, Negeri Sembilan, Malaysia

Abstract | **Case Report**

***Introduction*:** Colorectal cancer (CRC) is a leading cause of cancer-related deaths worldwide, commonly metastasizing to the liver, lungs, and peritoneum. However, metastasis to the skull, especially the occipital region, is exceedingly rare. This report presents a unique case of skull metastasis originating from advanced distal sigmoid adenocarcinoma, highlighting the importance of considering atypical metastatic sites in CRC patients. ***Aim*:** The aim of this report is to discuss the rare occurrence of skull metastasis from CRC, the diagnostic challenges, and the management strategies, emphasizing the need for heightened awareness in clinical practice. ***Materials and Methods*:** This case involves a 54-year-old female with a history of distal sigmoid adenocarcinoma, liver and lung metastasis, and a solitary osteolytic lesion in the right occipital skull region. Imaging, including CECT and MRI, was utilized for diagnosis. Treatment involved a multidisciplinary approach with chemotherapy, and palliative care was considered for the management of symptoms. ***Results and Discussion*:** The patient presented with a progressively enlarging, painless mass over the right occipital region. Imaging confirmed a metastatic lesion. Despite the rare occurrence of skull metastasis in CRC, this case exemplifies the importance of early detection. Although skull metastasis typically signals systemic spread and poor prognosis, aggressive management, including radiotherapy and chemotherapy, can result in favorable outcomes, particularly in isolated cases. ***Conclusion*:** Skull metastasis from CRC is a rare but significant clinical finding. Early identification and a multidisciplinary treatment approach can improve prognosis, especially in atypical metastatic cases. Clinicians should maintain a high index of suspicion for such presentations in patients with a history of CRC.

Keywords: Colorectal cancer, Sigmoid adenocarcinoma, Skull metastasis, Occipital bone, Osteolytic lesion, Palliative care.

INTRODUCTION

Colorectal cancer is the third most common malignancy worldwide, with adenocarcinoma being the predominant histological subtype. While metastases commonly involve the liver and lungs, cranial bone involvement is rare, accounting for less than 5% of bone metastases [1, 2]. Skull metastases from CRC are particularly uncommon, with few cases documented in literature. This rarity poses diagnostic challenges and necessitates awareness among clinicians for timely identification and management.

CASE HISTORY

A 54-year-old female with comorbidity of diabetes mellitus and advanced distal sigmoid adenocarcinoma with lung and liver metastasis in early 2023. She underwent Hartman's procedure during that admission. HPE turns out to be moderately differentiated adeno ca pT3N1M1. Postoperative she underwent palliative chemotherapy FOLFOX for 12 cycles. Then noted her tumour marker CEA was increasing trend, a repeated computer tomography (CT scan) was done noted worsening lung and liver metastasis. Case was discussed with oncology team for another second line chemotherapy FOLFIRI. Patient completed second line chemotherapy in December 2024. CT scan was repeated worsening lung cavitating lesion hence no further chemotherapy was offered.

The patient remained well till late march 2025. She reported a painless, progressively enlarging mass on

the right side of his head. Otherwise, she denies any other intracranial symptoms. Physical examination revealed a firm, non-tender mass over the right occipital region measuring 8x8cm. There is no any neurological deficit. CECT brain was done showed right occipital parietal bony metastasis with mass effect. MRI showed large solid cystic mass of right occipital region, suggestive of metastatic deposit.

However, patient refused for any surgical intervention. Hence, she was seen by the palliative team in ward and was referred back to oncology team for further chemotherapy or radiotherapy.

Figure 1: Patient with right parietal mass

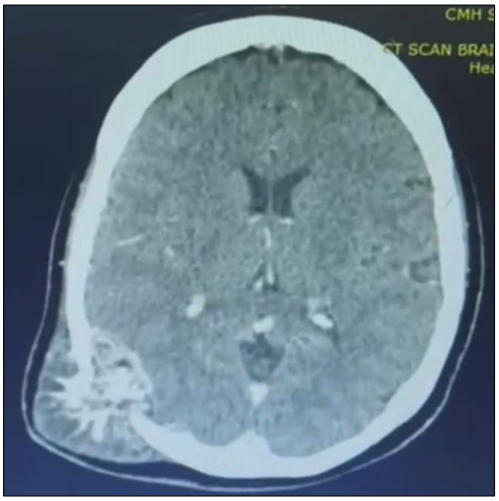

Figure 2: CECT Brain shows right occipital parietal bony lesion

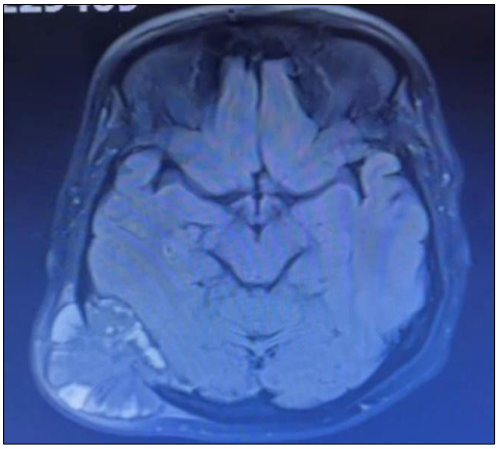

Figure 3: Mri Brain shows right occipital lesion

DISCUSSION

Colorectal cancer (CRC) is the third most common cancer globally and the second leading cause of cancer-related death. It most frequently metastasizes to the liver (via portal circulation), lungs, peritoneum, and lymph nodes. However, skeletal metastases are relatively uncommon, reported in approximately 10% of advanced CRC cases, and among these, skull involvement is extremely rare.

The skull is an unusual site for CRC metastasis, primarily due to anatomical and physiological barriers. When it occurs, the spread is believed to be hematogenous, bypassing the portal system and liver. One proposed mechanism involves the Batson's venous plexus, a valveless venous system that allows retrograde tumour embolization directly to the spine and cranial bones. This mechanism could explain solitary skull involvement without concurrent visceral metastases [1, 2].

Imaging modalities like MRI and PET-CT are crucial for diagnosis and staging. Histopathological confirmation with immunohistochemistry aids in identifying the primary source. Management involves surgical resection for isolated lesions, followed by radiotherapy and systemic chemotherapy [6, 7]. A multidisciplinary approach is essential for optimal outcomes.

Skull metastasis from CRC typically indicates systemic dissemination and is associated with a poor prognosis. However, when isolated and managed aggressively, as in this case, prolonged survival and good quality of life can be achieved [4, 5]. This reinforces the importance of early detection, especially in patients with prior CRC history presenting with new, unexplained cranial symptoms.

Additionally, this case illustrates the evolving spectrum of CRC metastasis in the era of improved survival with modern therapies [8]. As patients live longer, atypical metastatic patterns are increasingly encountered, requiring surgeons and oncologists to maintain a high index of suspicion and consider unusual presentations.

This case emphasizes the need for vigilance for atypical metastatic presentations in CRC patients, especially those with new, unexplained cranial masses.

CONCLUSION

This case highlights a rare instance of occipital skull metastasis from distal sigmoid adenocarcinoma. Early recognition and a comprehensive, multidisciplinary treatment approach can lead to favourable outcomes even in atypical metastatic scenarios. Clinicians should maintain a high index of suspicion for unusual metastatic sites in CRC patients presenting with new cranial symptoms or masses.

Conflict of Interest: None

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