Case Report

A Very Rare Case of Metastases to the Nasal Cavity from Primary Rectal Adenocarcinoma

Abstract

Nasal cavity as the first site of metastases from colorectal adenocarcinoma without metastases elsewhere is generally unheard of and very rare with only a few cases reported in world literature. The diagnostic dilemma and therapeutic challenge are significant when encountered in clinical practice, especially to differentiate it from a primary nasal pathology. Histopathological examination and immunohistochemistry play an important role. We report an unusual and interesting case of adenocarcinoma rectum with nasal metastases. A 65-year-old male was treated for adenocarcinoma rectum with radiotherapy, surgery and chemotherapy and was disease-free for 9 months post-treatment completion. Subsequently, he presented with nasal bleeding and on evaluation was found to have a nasal mass. Histopathological examination and immunohistochemistry confirmed the mass to be a metastasis from the earlier rectal adenocarcinoma. He received palliative haemostatic radiotherapy for bleeding from the nasal mass and was then treated with 6 cycles of 5-fluorouracil and irinotecan-based palliative chemotherapy. The patient achieved a good level of palliation, had near-complete regression of nasal mass on imaging with no new sites of metastases and hence was placed on regular follow up.

Keywords: *Metastases, Nasal cavity, Adenocarcinoma, Radiotherapy*

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Introduction

Colorectal cancer (CRC) is one of the most common malignancies in India with approximately 65,000 patients diagnosed with it and 38,000 deaths attributable to it annually.[1] Colon is the more common site with involvement in around two-thirds of the cases with the remaining one-third of cases occurring in the rectum. Adenocarcinoma is the predominant histology in >90% of cases. Approximately 30% of patients with colorectal cancer present with colorectal liver metastases.[2] Metastasis to the nasal cavity from primary rectal lesions is very rare. To the best of our knowledge and online search of the literature, to date, only five cases have been reported. In a clinical setting, it is difficult to distinguish it from a primary pathology of the nasal cavity. Therefore, we would like to present the diagnostic dilemma that we faced when we came across a patient with rectal adenocarcinoma who subsequently developed metastasis to the right nasal cavity.

Case report

In October 2017, a 65-year-old male patient, with no known co-morbidities, reported to our oncology centre with complaints of altered bowel habits of constipation for the past three months. A digital rectal examination (DRE) and colonoscopy revealed an indurated growth just above the anal verge. Contrast-Enhanced Computed Tomography (CECT) scans showed a circumferential wall thickening in the distal rectum and anal canal along with multiple, subcentimetric mesenteric and retroperitoneal lymph nodes. Metastatic workup in form of CECT thorax and abdomen revealed no lung or liver secondaries. He then underwent a diagnostic laparoscopy and biopsy from the rectal lesion. No peritoneal deposits were seen on the diagnostic laparoscopy. A diversion colostomy was done as the patient was symptomatic with intestinal obstruction. Biopsy from the rectal growth was suggestive of adenocarcinoma. A final diagnosis of locally advanced adenocarcinoma of the rectum was arrived at.

In December 2017, he was treated with neoadjuvant radiotherapy on an Elite-100 Telecobalt machine using two-dimensional (2D) treatment planning and delivery using a three-field set-up (posterior and bilateral

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pelvic fields). He also received oral capecitabine at a dose of 750 mg twice a day concurrently with radiotherapy. Four weeks after completion of the neoadjuvant therapy, the patient underwent an abdominoperineal resection in January 2018. Postoperative histopathological examination showed a 5cm x 5cm x 5cm ulcerated mass in the rectum extending into the anal canal. Microscopically, the tumour was a moderately differentiated adenocarcinoma with the invasion of the muscularis propria. There were signs of chemoradiation-induced tumour necrosis but no evidence of lymphovascular emboli or any perineural invasion. 03 out of the 07 lymph nodes that were dissected were positive for tumour deposits. On immunohistochemical (IHC) analysis, the tumour positively expressed CK20 and CDX2 while it was negative for CK7 which is commensurate with an intestinal-type adenocarcinoma (ITAC). The patient was then treated with five cycles of adjuvant chemotherapy (capecitabine and oxaliplatin) which he completed in September 2018.

After a disease-free interval of around 9 months, he presented again in July 2019 to our centre with complaints of nasal bleeding. An Ear Nose Throat (ENT) evaluation revealed a bleeding mass in the right nostril **(Figure 1)**. No enlarged neck nodes or any other significant positive finding was detected on clinical examination. A CECT of paranasal sinuses (PNS) found a 4.2cm x 3.2cm x 3.3cm soft tissue mass lesion with the destruction of surrounding bone and was also seen opacifying the right maxillary antrum and nasal cavity **(Figure 2)**. CECT Chest, abdomen and pelvis was essentially normal with no evidence of any local recurrence of primary or any other distant metastases. Microscopic examination of the hematoxylin and eosin (H & E) stained nasopharyngeal biopsy tissue revealed deposits of tumour cells arranged in trabecular, sheets and a glandular pattern that was suggestive of adenocarcinoma **(Figure 3a)**. Further, on IHC analysis nasal biopsy of the lesion expressed Pan cytokeratin (CK), CK20 and CDX2 but CK7, CK5/6 and P40 were negative **(Figure 3)**. Thus, the nasal mass's histopathology and the IHC profile were identical to the patient's previous primary tumour from the rectum.

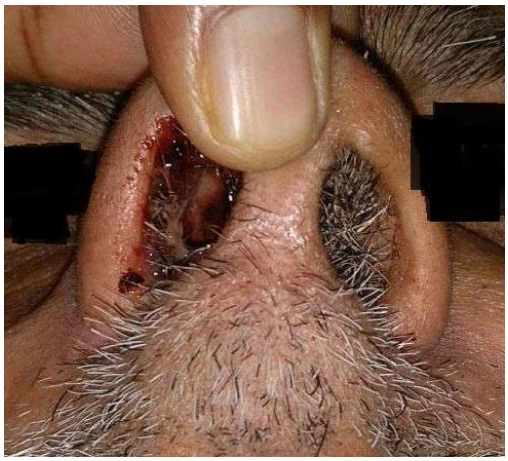


Figure 1. The patient presented with bleeding from the nasal mass.

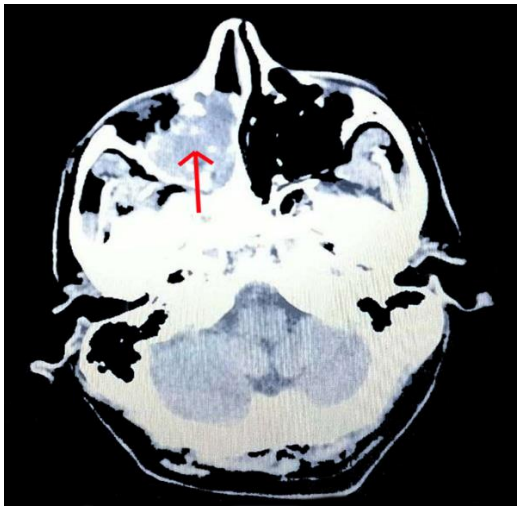
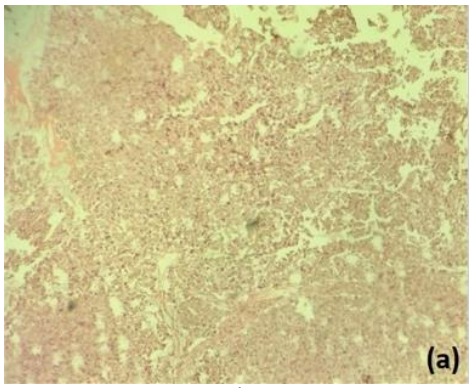
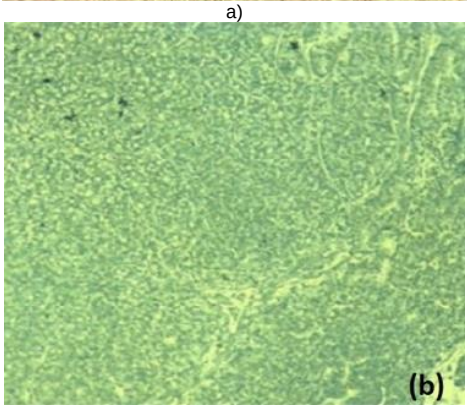


Figure 2. A Computed Tomography scan showing soft tissue mass in the right maxillary antrum and nasal cavity



a)



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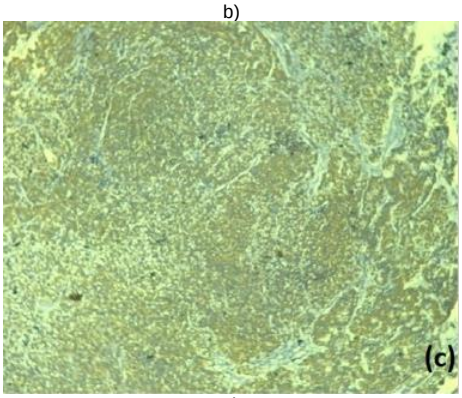
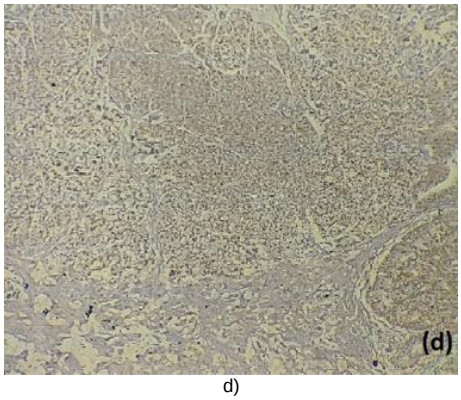


c)



d)

Figure 3. a) H and E stain (10X) showing deposits of tumour cells arranged in trabecular, sheets and glandular pattern; b) tumour cells showed negative staining for cytokeratin 7 (CK7) (10X); c) tumour cells showed positive cytoplasmic staining for cytokeratin 20 (CK20) (10X); d) tumour cells showed positive cytoplasmic staining for CDX2 (10X)

Considering the above findings, the case was discussed in a multidisciplinary tumour board and the final consensus of the diagnosis was nasal metastases of rectal adenocarcinoma. Given persistent nasal bleeding, bony invasion and poor general condition, he was deemed unfit for surgical resection of the nasal mass. He has been treated with palliative haemostatic radiotherapy to nasal mass to a dose of 30 Grays in 10 fractions on a telecobalt machine which was completed in August 2019. He was subsequently treated with 6 cycles of 5-fluorouracil and irinotecan-based palliative chemotherapy. After treatment in January 2020, the patient was asymptomatic and was seen to have near-complete regression of nasal mass on imaging with no new sites of metastases. With a good level of palliation having been achieved, the patient was placed on regular follow-up.

Results and Discussion

Metastases to the sinonasal tract from colorectal carcinoma are very rare. In the available literature, renal cell carcinoma (RCC) is the most commonly described primary cancer that metastasizes to the sinonasal tract, accounting for almost half of all reported cases.[3] In fact, nasal primary malignancies are far more common than nasal metastases. Moreover, metastasis to no other sites was found in our patient. Hence, it was important to rule out a second primary adenocarcinoma as the cause of nasal cancer.

Patients with both primary sinonasal carcinoma and metastases to the sinonasal tract can have similar symptoms of nasal obstruction, recurrent epistaxis and facial pain.[4] Our patient also presented with a history of epistaxis. There are also no explicit radiological features that can differentiate between primary or secondary adenocarcinoma of the nasal cavity. Thus, pathological features and IHC were the only resort to come to a definite diagnosis. Histologically, the tumour was an adenocarcinoma. On IHC analysis, ITAC positively expresses CK20 and CDX2 while expression for CK7 is very often but not always seen in primary sinonasal adenocarcinomas. In our case also, CK7 was negative while CK20 and CDX2 were positive suggesting it to be of colorectal origin. Both the CK7-/CK20 + phenotype and CDX2 antibody expression are highly specific and sensitive markers of the origin of colorectal cancer, and the specificity of CK7-/CK20 + is 97.6%.[5] In our case, expression of CK20 and CDX2 with no expression of CK7, though does not rule out a primary tumour completely, but does strongly point towards metastasis from the colorectal carcinoma. This is a good example that even with all state-of-the-art diagnostic facilities available, it is impossible to call the tumour in the nasal cavity a primary or secondary with 100 per cent certainty. But, with the available clinical evidence, and literature support, the multidisciplinary tumour board unanimously favoured the diagnoses of metastases over a primary tumour.

Tumours arising above the anorectal ring generally metastasize along the distribution of the middle rectal vessels to the internal iliac lymph nodes. Cancers arising in the anal canal due to caval drainage most commonly metastasize to the lungs rather than the liver, as is common with most true rectal cancers and colon cancers (portal drainage).[6] As no metastasis to other sites was found in our patient, the tumour spread might have occurred from the vertebral venous plexus. In 1940, Batson postulated that through the low-pressure valveless system connecting deep pelvic veins, intercostal veins, vena cava, and the azygous system, retrograde metastasis to nasal and paranasal sinuses occurs, during increased intrathoracic and abdominal pressure.[4]

As per the available case reports in the literature, colorectal cancer with nasal metastases had a poor outcome, with none of the case reports having a median survival of 5 years from the diagnosis of the nasal metastases. Moreover, all the cases reported in the literature searched received palliative radiotherapy to the nasal region.[7] However, due to the scarcity of cases of sinonasal tract metastases from primary rectal adenocarcinoma, the actual survival trends in such cases cannot be commented upon.

ITACs are morphologically indistinguishable from gastrointestinal tract adenocarcinomas.[8] Primary adenocarcinomas of the nasal cavity have a much better prognosis and can be treated with curative intent. On the contrary, nasal metastases from colorectal primary carry a very poor prognosis and are usually fit for palliative treatment only.[9] Hence, differentiating between the two becomes very important. Due to the rarity of such cases, this case may help throw light on the importance of clinical, radiological, histopathological, and immunohistochemical features in diagnosing a nasal cavity mass in a pre-existing rectal adenocarcinoma as primary or metastatic.

To summarize, after an extensive literature search in Pubmed and Medline, only 5 reported cases of sinonasal tract metastases from primary colorectal cancer were found and our case appears to be the first such case from the Indian subcontinent. In patients presenting with nasal adenocarcinoma even with a prior history of colorectal adenocarcinoma, a second primary always needs to be ruled out and differentiated from metastasis to the nasal tract.

Immunohistochemistry and axial imaging to look for other sites of metastases, especially liver and lung, can be extremely useful in such a clinical setting. The role of a multi-speciality tumour board, with all clinical and diagnostic branches represented, is also exceedingly relevant.

Conclusion

The unusual and rare location of the nasal cavity as the first site of metastases from a rectal cancer, made diagnosis difficult in this case. There was a high probability of misdiagnosis as a second primary from nasal cavity, but immunohistochemistry allowed the identification of tumour cells as having originated from a colorectal primary. Colorectal carcinoma metastasising to sinonasal tract is very rare and has a poor outcome, but the study had a good control of both local and distant disease with palliative radiotherapy and chemotherapy. Hence, the purpose of reporting this unusual case of colorectal carcinoma with metastatses to sinonasal tract was to highlight the diagnostic dilemma, the advantages of immunohistochemistry and relatively good therapeutic outcome achieved.

Acknowledgments

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Conflict of interest

None.

Financial support

None.

Ethics statement

The study was approved by the Institutional Ethics Committee. Informed Consent for the publication of the case report and images was obtained from the patient. The patient's identifying information has not been revealed in the report.

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