# Nasopharyngeal Metastasis From Colorectal Cancer: A Case Report

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**Case report**

**Keywords:** nasopharyngeal metastasis, colorectal cancer

**Posted Date:** August 28th, 2020

**DOI:** https://doi.org/10.21203/rs.3.rs-63557/v1

# Abstract

**Background:** Nasopharyngeal metastasis from colorectal cancer has never been reported in the past.

**Case presentation:** In this paper, we establish a case report of a 79-year-old man suffering from adenocarcinoma of the rectum with distant metastases to the liver, lung, and nasopharynx. Over the past 7 years, he received radical surgery for rectal cancer (miles surgery), chemotherapy, hepatectomy, and pneumonectomy.

**Conclusions:** We equally discuss the histopathological and clinical aspects associated with this condition.


# Background

Metastases from colorectal cancer can occur either by lymphatic or hematogenous spread, and the sites most commonly involved are the liver and lungs. Atypical sites of metastases from colorectal cancer involves organs such as the spleen, thyroid gland, spermatic cord, and skeletal muscles[1–4]. Even though metastases to these sites might occur as a feature of end-stage disease, metastasis to the nasopharynx from colorectal cancer had never been observed. For the very first time, we hereby report a case of nasopharyngeal metastasis from colorectal cancer 7 years after radical surgery for rectal cancer (miles surgery). Furthermore, we also perform a concise review of the histopathological and clinical aspects of this rare entity, and ultimately evaluate adequate diagnostic and therapeutic options based on our observation of the case.

# Case Presentation

In October 2012, a 72-year-old man was admitted to our hospital with a chief complain of passing bloody stools for 2 months without seeking any medical attention. The patient denied any abdominal pain and tenesmus. The patient also recorded a weight lost of 2 kg within the past 6 months of presenting at our hospital. A colonoscopy revealed a budding tumor in the rectum that easily bled. A histopathological analysis of the biopsy showed chronic inflammation of the rectal mucosa with high-grade intraepithelial neoplasia (microscopically, it presented a highly differentiated adenocarcinoma). A computed tomography (CT) scan of the chest, abdomen, and pelvis, and brain magnetic resonance imaging (MRI) depicted no abnormalities. He underwent radical surgery for rectal cancer (miles surgery) with a subsequent histopathological finding demonstrating an ulcerative type of moderately-poorly differentiated colorectal adenocarcinoma (size 3*3 cm), infiltrating all the layers of the intestinal wall and the adipose tissue outside the serous membrane. Four regional lymph nodes were resected and none showed metastases (pT4N0M0, Stage II ). Immunohistochemical analysis displayed BcL-2( - ) P53( + ) k-ras( - ) (Fig. 1). The status of MSI proteins and BRAF was not verified. Two months later, he received a chemotherapeutic regimen including oxaliplatin and capecitabine. However, the oxaliplatin injection was

discontinued due to a severe allergic reaction elicited at the first dose and capecitabine was stopped following the severe hand-foot syndrome (HFS) after four cycles.

During the 7 years following surgical resection, he was on regular follow-up every 3 months with blood tumor markers examination and CT scans of the chest, abdomen, and pelvis. Unfortunately, the patient underwent three operations during this period due to distant metastasis to the liver and lung. In June 2014, he received a hepatectomy after a CT Scan of the abdomen demonstrated a single low density lesion in the right hepatic lobe (Fig. 2). The patient subsequently underwent two endoscopic pulmonary wedge resections of isolated metastatic pulmonary lesions from colorectal cancer detected by a chest CT Scan in November 2016 and February 2017(Figure3A.B,4A.B). Meanwhile, blood tumor marker examinations were always within a normal range.

In August 2019, the 79-year-old man presented at his regular follow-up visit with headaches, double vision, and upper eyelid drooping of the right eye and obvious right-sided hearing loss lasting for a week. There was no enlargement of the cervical lymph nodes during the physical examination. The serum NSE level was 17.9 ng/ml ↑(0–15)and CYFRA21-1 was 17.7 ng/ml ↑（0–13）respectively. Brain MRI displayed multiple lacunar infarctions within the brain. Moreover, a right bony mass in the skull base and clivus involving the parapharyngeal space, cephalic longus muscle, and cavernous sinus was observed, for which metastases or nasopharyngeal primary malignancies were considered as differentials（Figure5）. Further examination by electronic nasopharyngoscopy revealed a large number of new cauliflower-like masses in the posterior roof wall of the nasopharynx and the right pharyngeal recess with its surface full of necrotic tissues. The texture was brittle and easy to bleed during biopsy (Fig. 6). The histopathological exam demonstrated adenocarcinoma with extensive necrosis which was consistent with intestinal adenocarcinoma metastasis to the nasopharynx based on immunohistochemical results and clinical history. Immunohistochemical analysis displayed CDX-2( + ) CK20( - ) NapsinA( - ) TTF-1( focal + ) Villin( + ) (Fig. 7). Local nasopharyngeal radiotherapy was therefore commenced while the gene detection illustrated a CODE600 V600E mutation. (DT:6000 cGy/30f, 200 cGy/f). Afterwards, the patient developed pharyngoxerosis, dysgeusia (bitter taste), odynophagia, and other side effects of radiotherapy. A chest CT scan exhibited small nodules suffused in both lungs, with the biggest nodule located proximal to the the right oblique fissure (Fig. 8). Multiple enlarged lymph nodes were present in both pulmonary hila and the mediastinum, with local pleural thickening, all suggesting disease recurrences. Despite the fact that chemotherapy was the most appropriate treatment option for metastatic colon cancer, the patient did not consent, principally because of intolerance to previous chemotherapeutic regimens and the fear of severe allergic reactions. After radiotherapy, the patient's quality of life significantly declined mainly due to nasosinusitis, tympanitis, hearing loss, pharyngoxerosis, hypogeusia, and restriction of mouth opening. During the follow-up, the disease progressed rapidly. The patient eventually died of dyspnea caused by airway obstruction of the nasopharyngeal mass after 7 months of palliative treatment such as pain relief for end-stage disease in March 2020.

# Discussion

Colorectal cancer, commonly known as bowel cancer, comprises cancerous growth in the colon, rectum, and appendix, and depending on the definition criteria used can also include those found in the anus. Bowel cancer is classified according to the tumor node metastasis (TNM) staging system into stages I, II, III, and IV. Cancer that metastasizes to distal sites (stage-IV ) is usually non-curable. The regional lymph nodes, liver, and lungs are the most common sites of metastasis associated with colorectal cancer. Infrequent sites of metastasis, including the spleen, thyroid gland, spermatic cord, and skeletal muscle have also been recorded[1–4]. Although metastases from colorectal cancer to these unusual sites might occur with the status of widespread disease, nasopharyngeal metastasis from colorectal cancer had never been reported prior to this article. To our knowledge, this is the first case of nasopharyngeal metastasis from primary clorectal cancer to be reported in the literature. At present, there are four mechanisms of metastasis linked with colorectal cancer which consist of lymphatic spread, direct extension, hematogenous spread, and planting spread. Theoretically, based on the analysis of the lymphatic reflux principle and anatomical location of the nasopharynx, we speculate that hematogenous spread of the primary colorectal cancer represents the most likely mechanism of metastasis in this case.

Nasopharyngeal carcinoma often develops at the roof of the nasopharyngeal posterior wall, generally with a cauliflower-like shape which is consistent with our report. Primary cancer is common in nasopharyngeal malignancies, thus making it difficult to determine whether this lesion is metastatic or not. In this regard, attention should be paid to the patient's other symptoms, signs, and medical history which are essential for diagnosis [4]. The main clinical manifestations of nasopharyngeal carcinoma include neck mass (40%), retracted blood snot (18.7%), and ear disorders (17.0%). The rate of lymph node metastasis was 82.3% at the time of diagnosis[5]. End-stage patients may present with ocular symptoms due to the nasopharyngeal carcinoma invading the external ocular muscles and/or oculomotor nerve[6]. Likewise, nasopharyngeal metastatic carcinoma can also cause the aforementioned symptoms. Luckily, histopathological and immunohistochemical examinations enable us to identify the tumor origin of the same tissue class. In our case, the caudate homologous transcription factor 2(CDX-2) testing positive indicates that the nasopharyngeal neoplasm is a metastasis of colorectal adenocarcinoma to the nasopharynx. CDX-2 is a tumor suppressor gene, and related studies have proven that it is closely related to the development and differentiation of normal intestinal epithelial cells into cancer[7–8].

As everyone knows, the common treatment options for colorectal carcinoma consist of surgery, chemotherapy, radiotherapy, and target therapy. According to the findings of the current study, chemotherapy did not produce a favorable effect on elderly patients with nasopharyngeal malignancies. On the other hand, radiotherapy is the most commonly used and effective treatment modality for head and neck tumors. Except for some severe acute reactions of radiotherapy, both elderly and young patients are generally able to tolerate radiotherapy [9–11]. Over the past 40 years, with the advancement of technology and pharmacotherapy, more effective therapies for cancer have been developed under integrated clinical management. We conclude that these multiple relapses could be explained by a lack of adjuvant chemotherapy. Our case of atypical colorectal metastasis reminds us of the fact that the risk posed by hematogenous spread increases as the disease.progesses

In conclusion, nasopharyngeal metastases from colorectal cancer are extremely rare clinical entities. To the best of our knowledge, this is the first case reporting this occurrence, which not only enriches the database of this rare clinical entity but also reminds clinicians to be aware that metastatic carcinoma should be a top differential diagnosis when head and facial symptoms appear during the treatment of colorectal cancer. In these cases, clinical detections such as nasopharyngoscopy and brain MRI should be performed as soon as possible. These head and facial symptoms cannot be ignored, since they may indicate rapid progress and poor prognosis. Strict monitoring of patients with colorectal cancer after primary treatment would lead to the early diagnosis of such metastases and give patients more opportunities of treatment for a better prognosis.

# Abbreviations

Computed tomography (CT)

Magnetic resonance imaging (MRI)

Hand-foot syndrome (HFS)

Tumor node metastasis (TNM)

Caudate homologous transcription factor 2 (CDX-2)

# Declarations

### Ethics approval and consent to participate

Written informed consent was obtained from the patient and legal guardian for publication of this research.

### Consent for publication section

Written informed consent was obtained from the patient and legal guardian for publication of this research.

### Availability of data and materials

Ture.

### Competing interests

None.

### Funding

None.

### Acknowledgments

None.

### Authors' contributions

LYH drafted and designed the manuscript, and also collected the patient's data and clinical records. LBB assisted with the collection of the patient's data and clinical records. LSX helped to edit and revise the manuscript. All the authors have read and approved the final manuscript.

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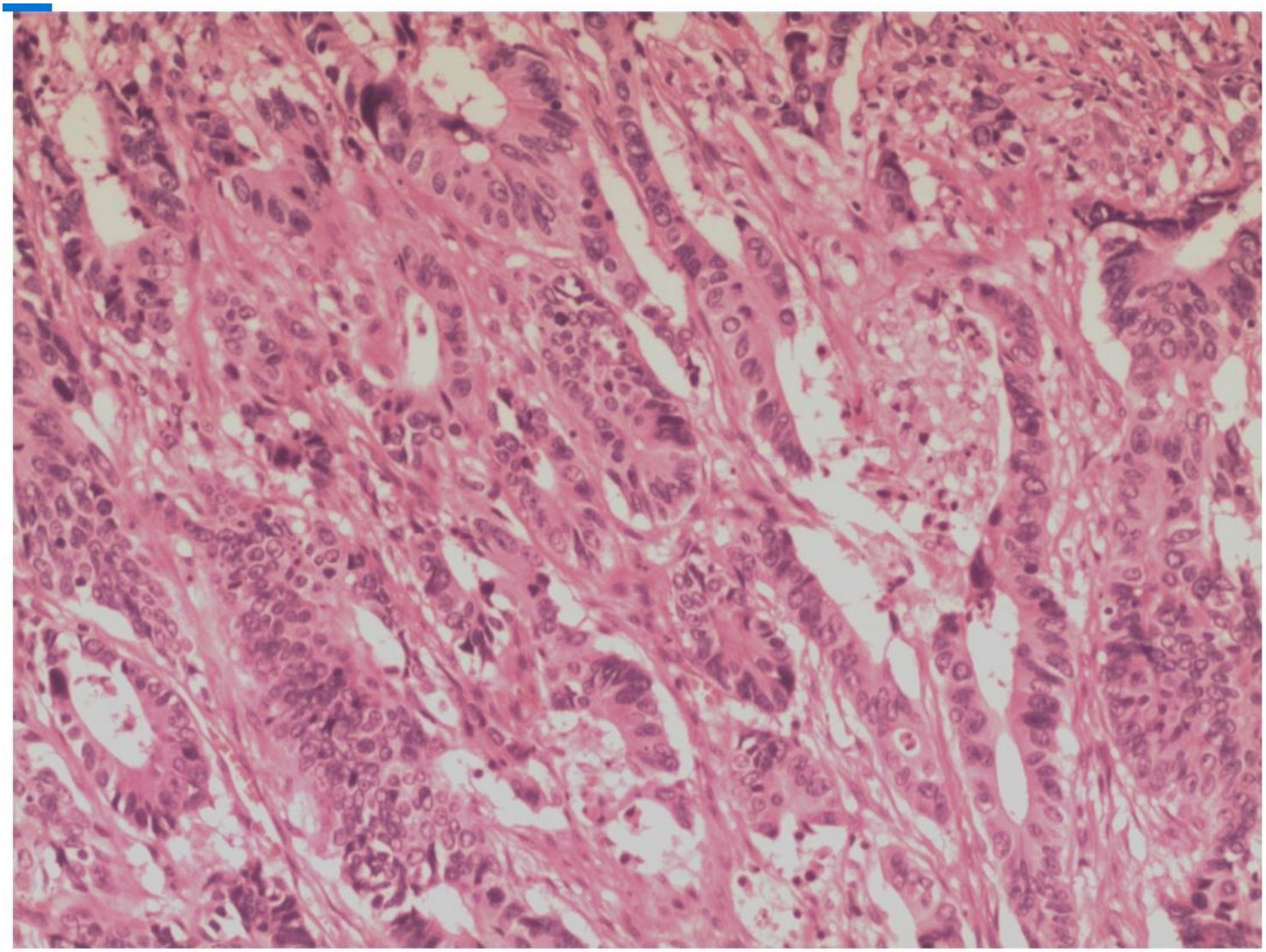
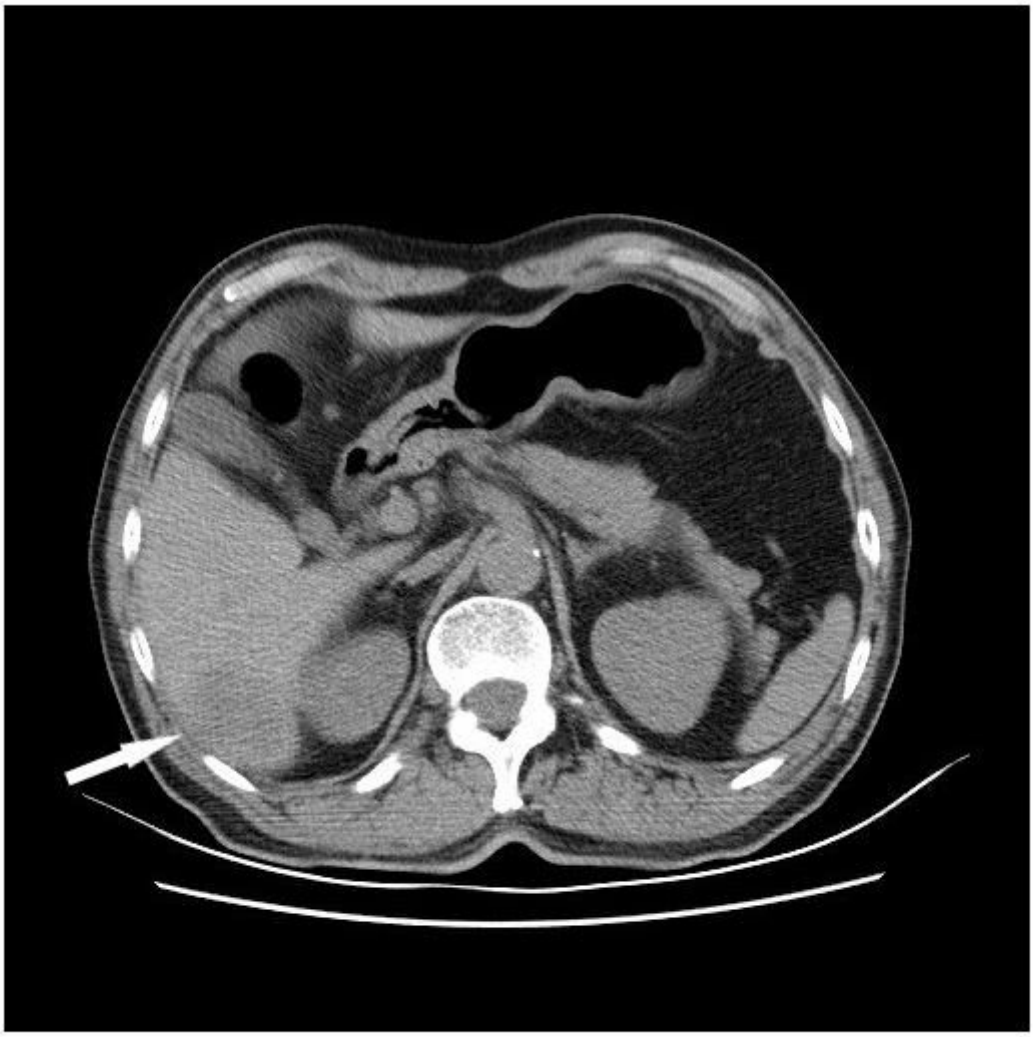
## Figures



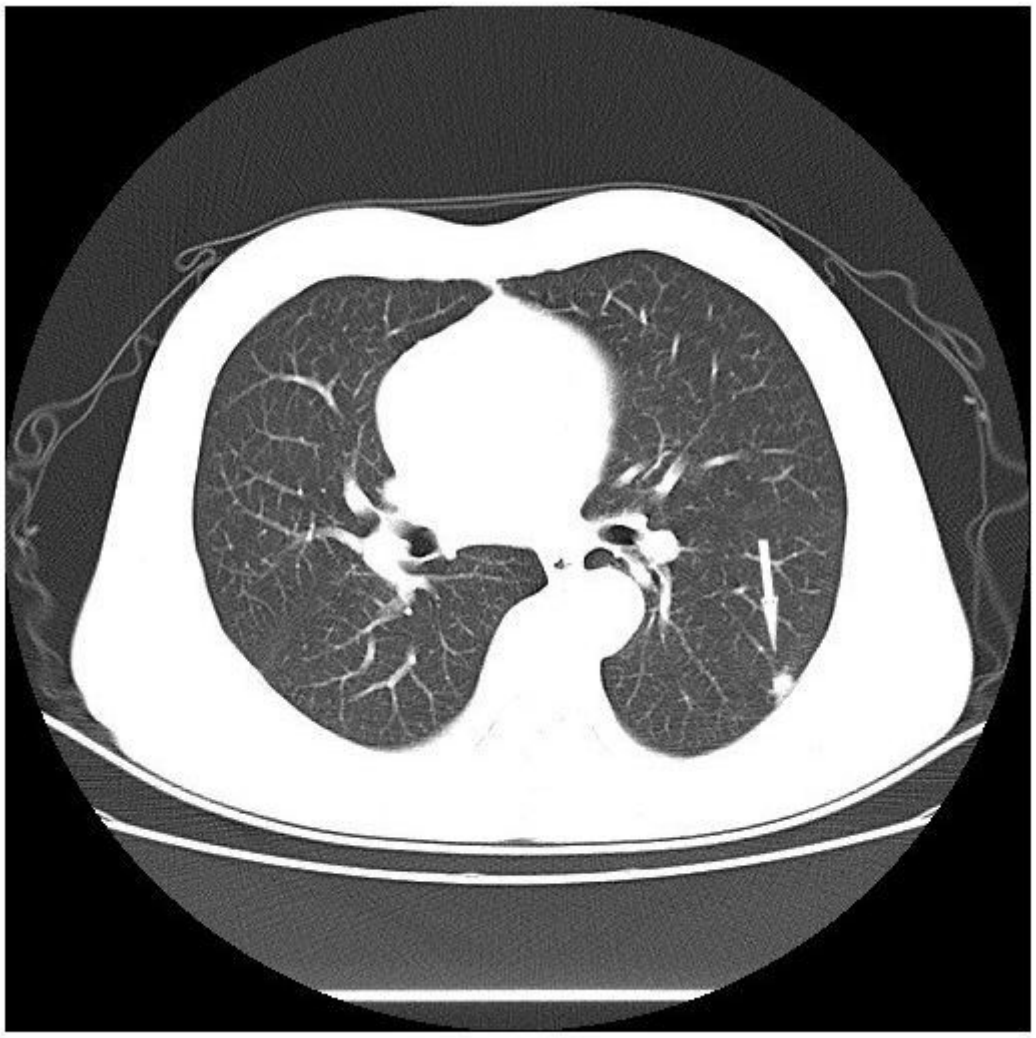
## Figure 1

Tall malignant columnar cells lining large irregular glands (hematoxylin-eosin staining, magnification×100). Histopathological exam revealed an ulcerative type of moderately - poorly differentiated adenocarcinoma. Immunohistochemical analysis displayed BcL-2( - ) P53( + ) k-ras( - ).



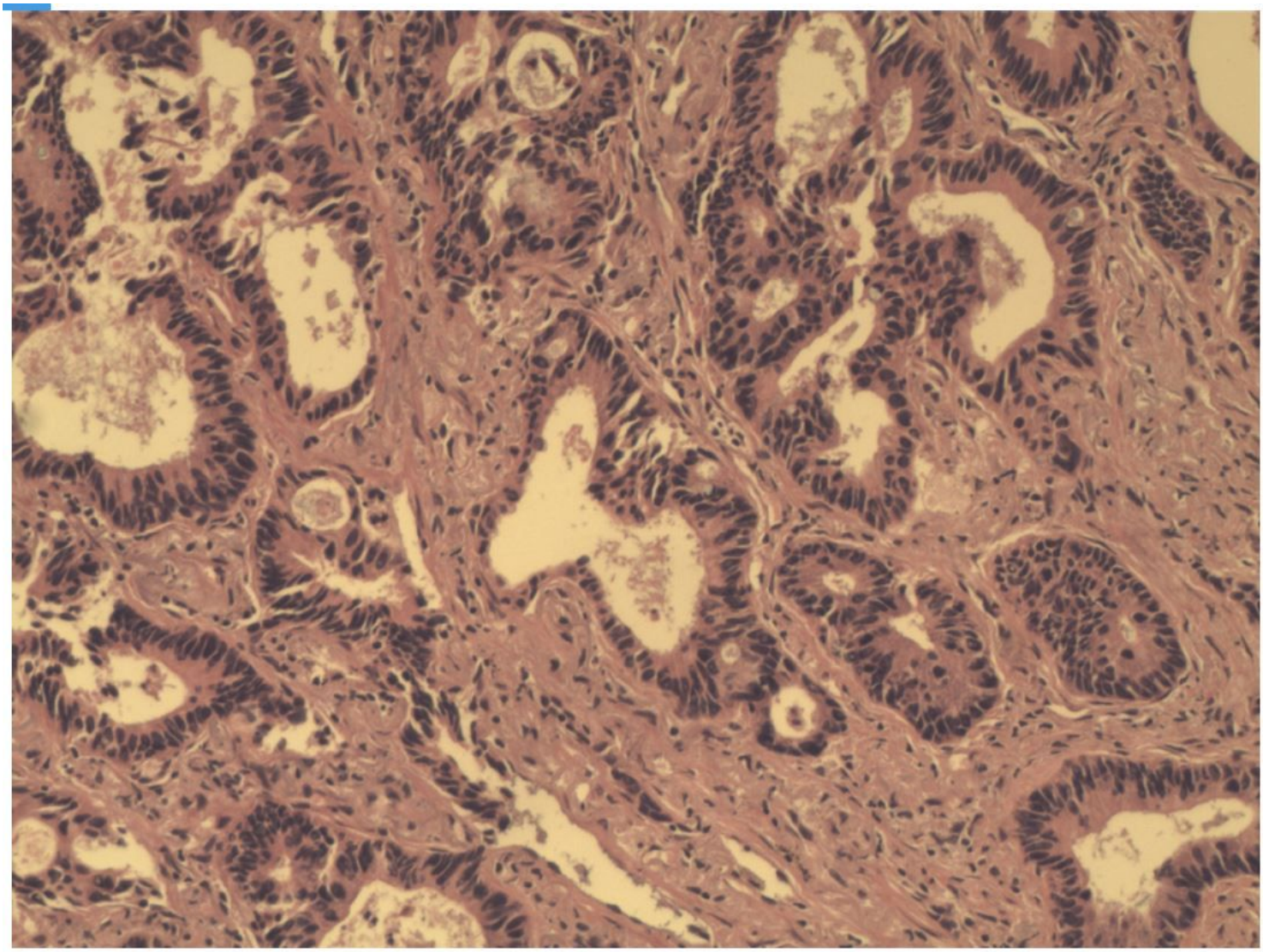
## Figure 2

Abdominal CT scan demonstrating, in the horizontal view, a single low density lesion (arrow) in the right hepatic lobe (size 3.8*2.8cm).



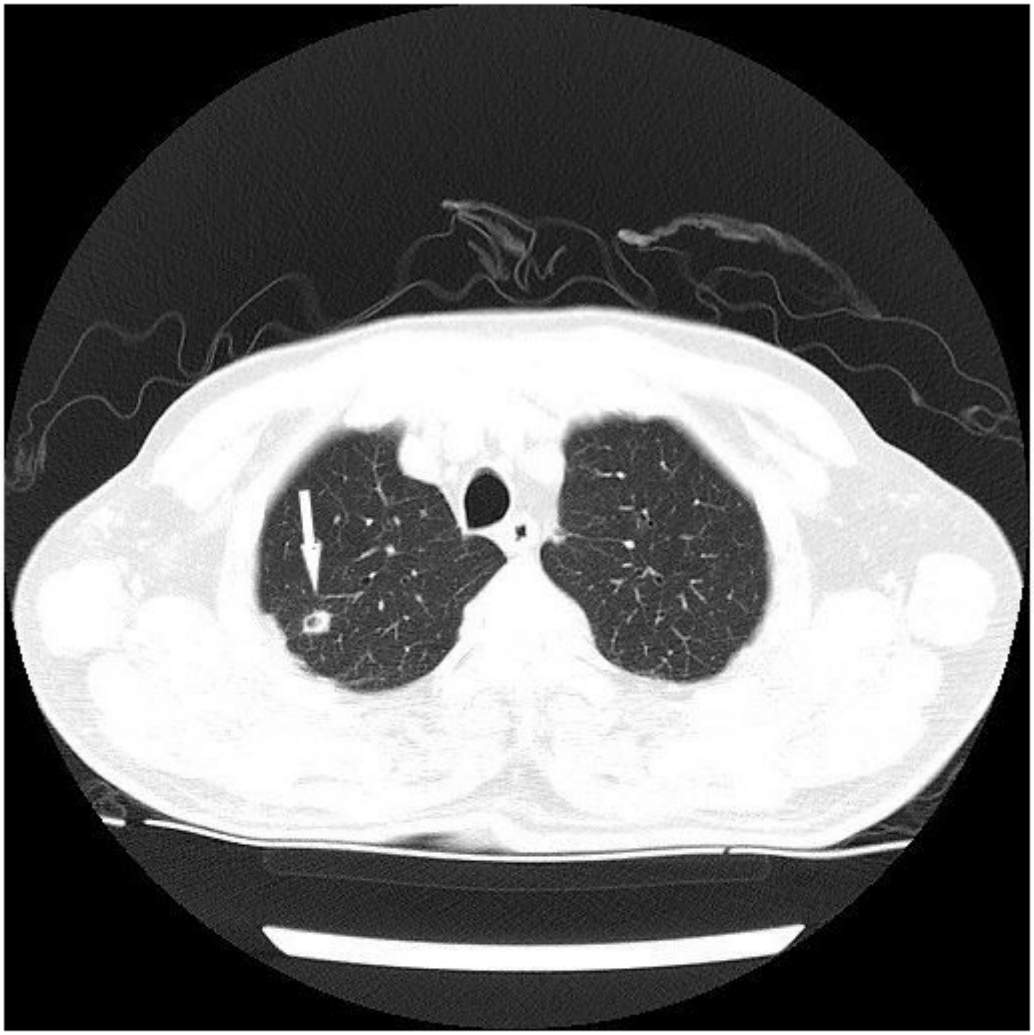
## Figure 3

Chest CT scan demonstrating, in the horizontal view, a isolated nodule of 9mm in diameter (arrow) in the lobe of the left lung.



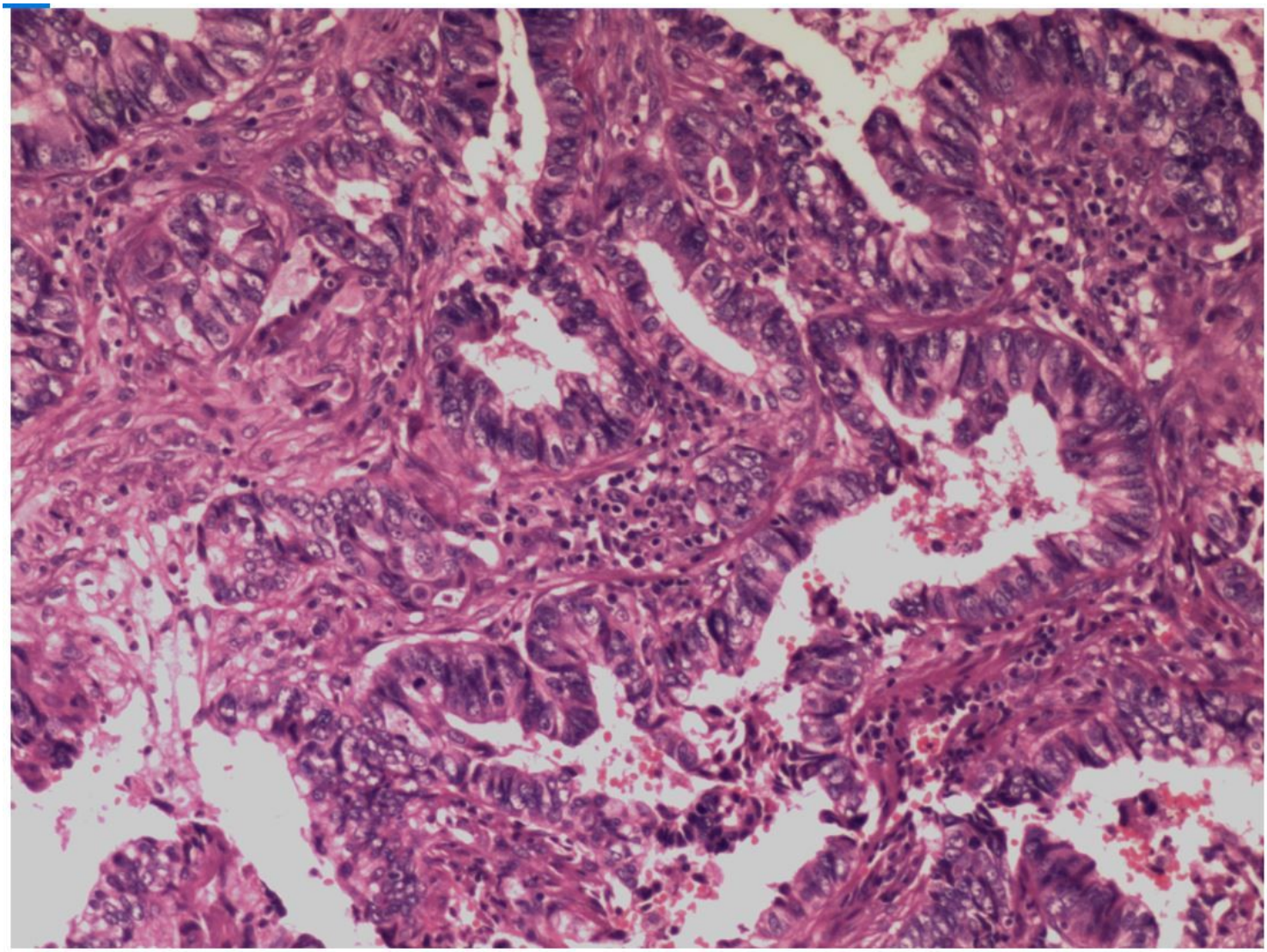
## Figure 4

Adenocarcinoma spread to the left lung parenchyma (hematoxylin-eosin staining, magnification×100). Histopathological exam revealed tubular adenocarcinoma with a small amount of necrosis. Immunohistochemical analysis displayed CDX-2( +++ ) CK20( - ) CK7( - ) TTF-1( - ) Villin(++).



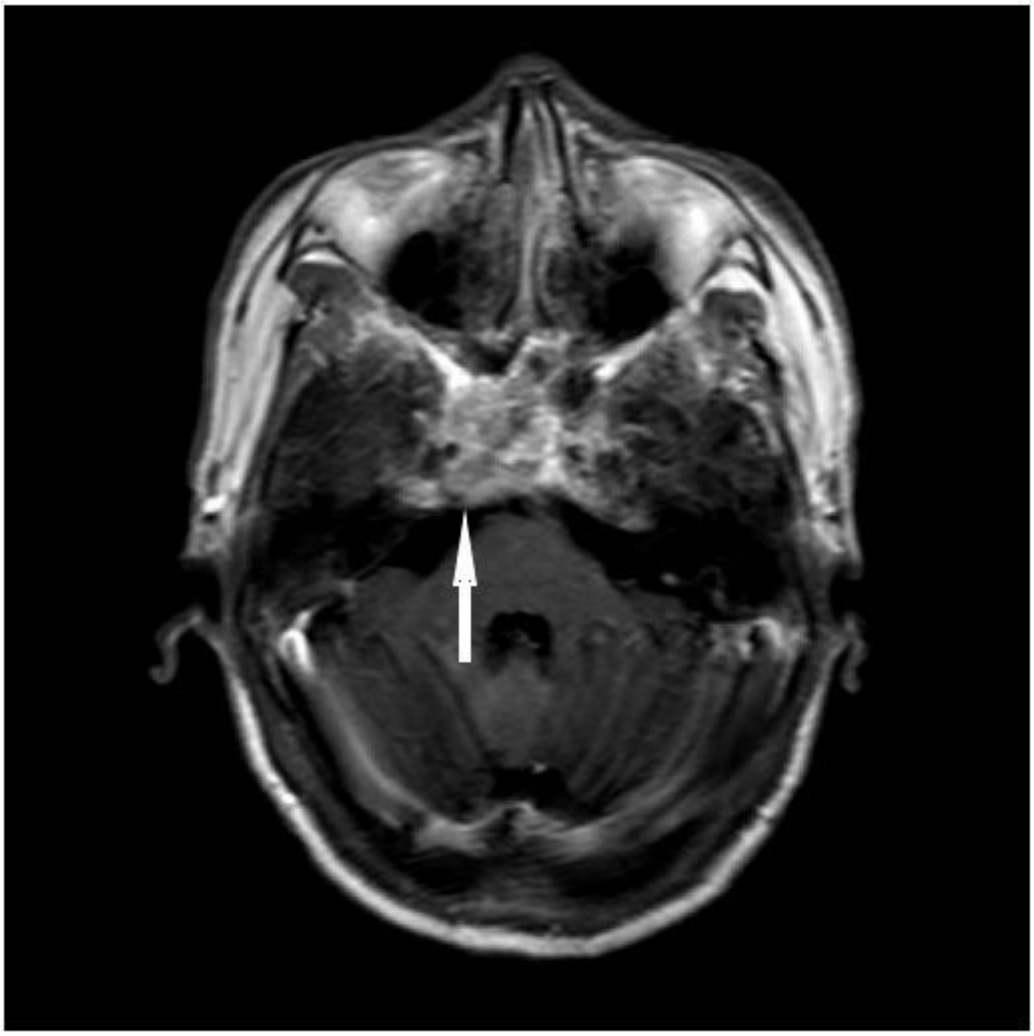
## Figure 5

Chest CT scan demonstrating, in horizontal view, a isolated 11mm in diameter nodule (arrow) in the upper lobe of the right lung.



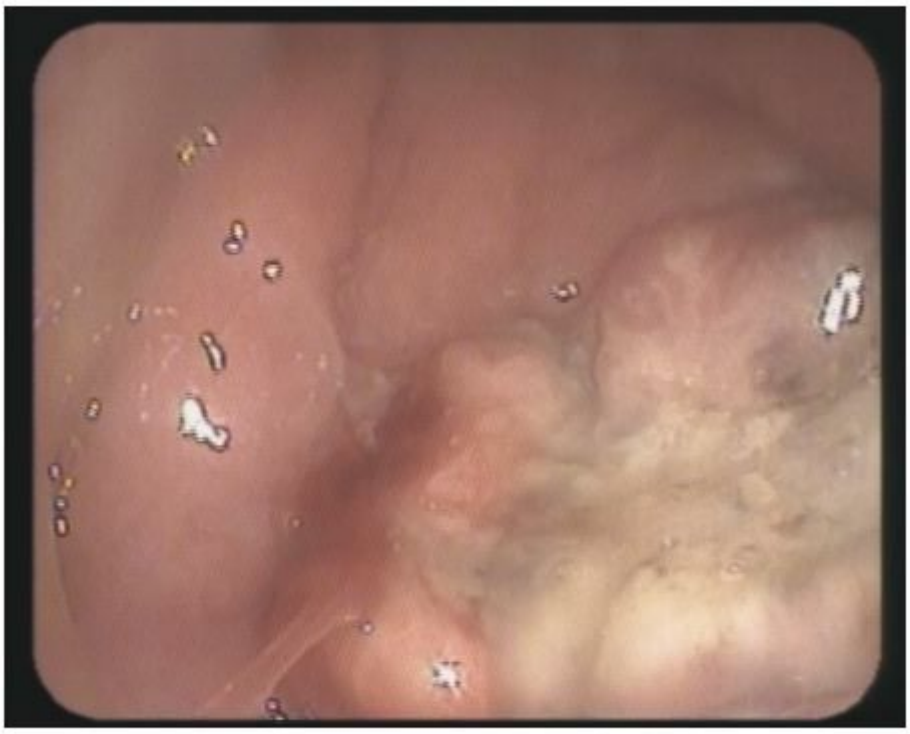
## Figure 6

Adenocarcinoma spread to the right lung parenchyma (hematoxylin-eosin staining, magnification×100). Histopathological exam revealed of moderately differentiated tubular adenocarcinoma. Immunohistochemical analysis displayed CDX-2( + ) CEA( + ) CK20( + ) CK7(-) TTF-1(-) Villin(+).



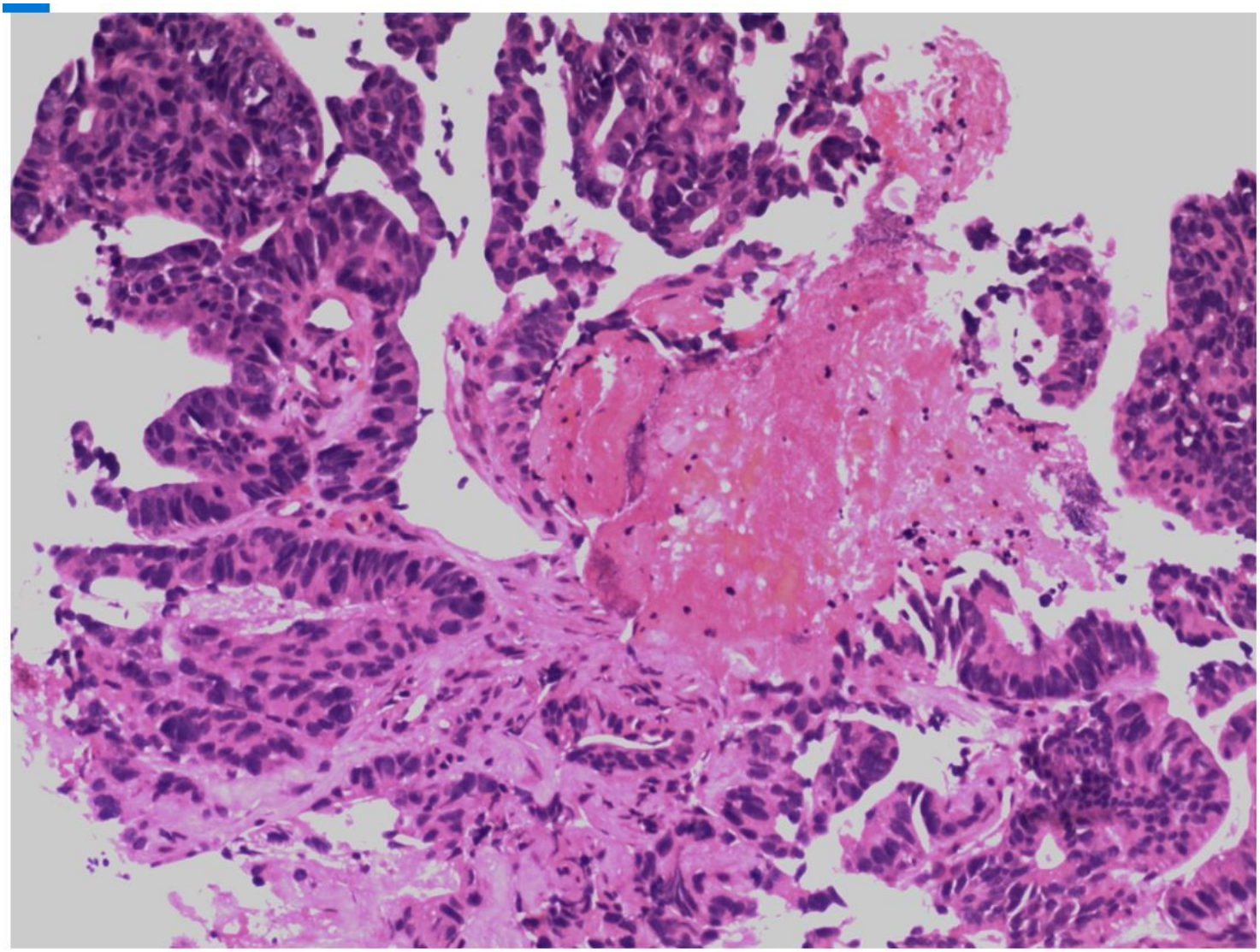
## Figure 7

Brain magnetic resonance imaging demonstrating, in the horizontal view, a right bone mass (arrow) in the skull base and clivus invading the parapharyngeal space, cephalic longus muscle, and cavernous sinus (T1W, FLAIR).



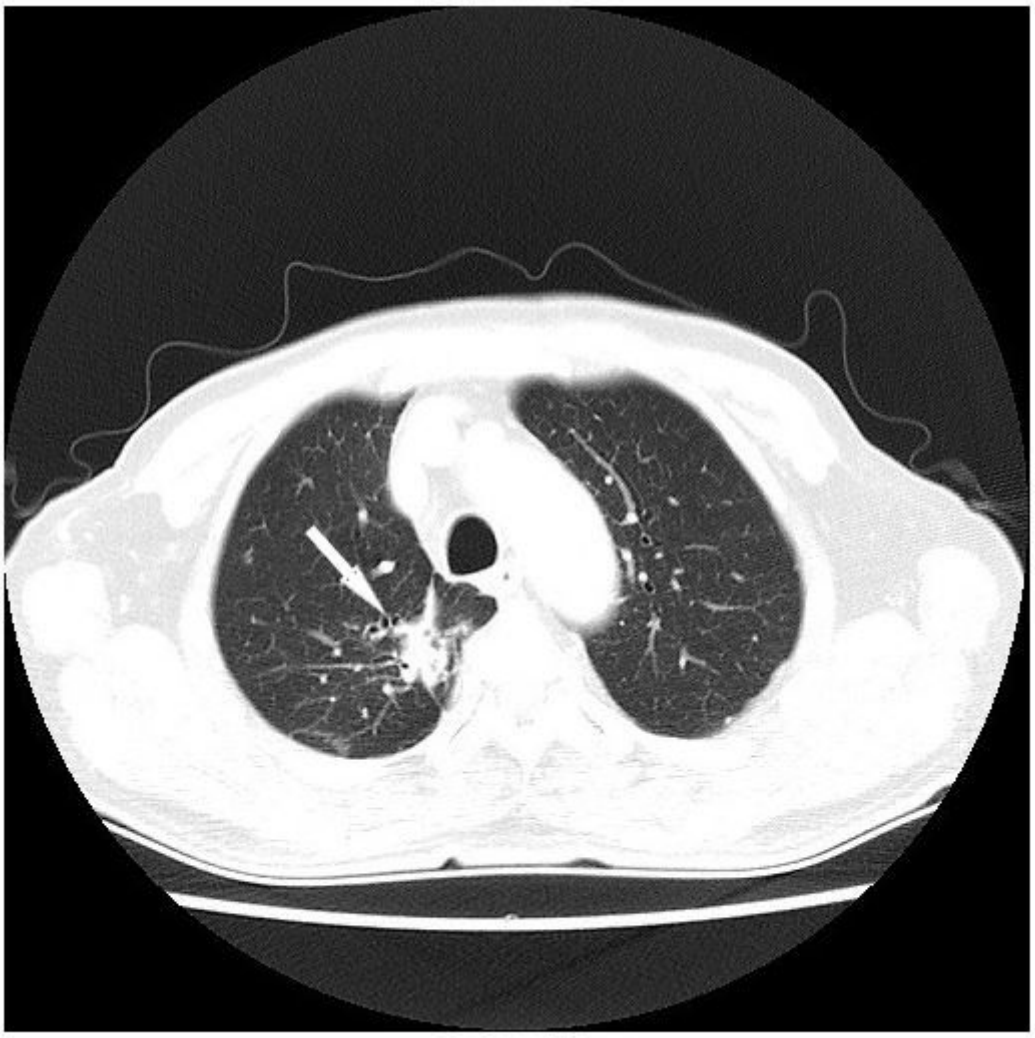
## Figure 8

Electronic nasopharyngoscopy illustrating, a large number of new cauliflower-like masses in the roof of the posterior wall of the nasopharynx and the right pharyngeal recess, With a brittle texture and easy to bleed during biopsy.



## Figure 9

Adenocarcinoma spread to the nasopharyngeal parenchyma (hematoxylin-eosin staining, magnification×100).The histopathological exam revealed adenocarcinoma with extensive necrosis. Immunohistochemical analysis displayed CDX-2( + ) CK20( - ) NapsinA( - ) TTF-1( focal + ) Villin( + ).



## Figure 10

Chest CT scan demonstrating, in the horizontal view, small nodules suffused in both lungs, with the biggest one (arrow) proximal to the right oblique fissure (size 2.5*1.8CM).