

# Papillary carcinoma of thyroid with paranasal sinus metastases

Renu Madan, Shikha Goyal, Amit K. Dinda<sup>1</sup>, Bidhu K. Maohanti

Departments of Radiation Oncology and <sup>1</sup>Pathology, All India Institute of Medical Sciences, New Delhi, India

## ABSTRACT

Tumors that metastasize to paranasal sinus (PNS) are rare, with fewer than 200 cases reported worldwide. Of these, thyroid malignancies contribute 8%. We discuss here a patient aged 45 years with PNS mets from follicular variant of papillary carcinoma thyroid who had undergone surgery and radioiodine ablation. He presented with nasal obstruction and epistaxis 2 years after local treatment. CT scan of PNS showed a large heterogeneously enhancing mass lesion in PNS, which on further evaluation was found to be consistent with metastases from primary thyroid cancer. He was given palliative radiotherapy to the metastatic lesion. Patient was alive after eighteen months of radiotherapy but there was no response to radiotherapy on imaging. To conclude PNS metastases from thyroid cancer are rare. But it should be always kept in mind in symptomatic patients. Also, patients with PNS mets can have a long disease free survival after palliative radiotherapy.

**Key words:** Carcinoma thyroid, paranasal sinus metastasis, radiation therapy, radioiodine ablation, surgery

## INTRODUCTION

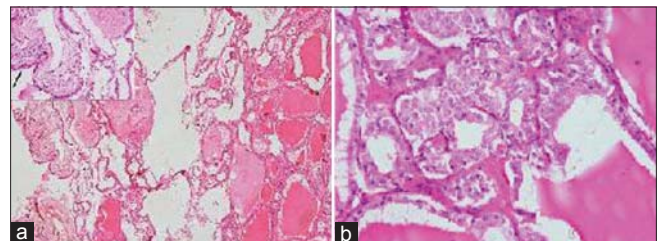
Differentiated carcinoma of the thyroid (DCT) accounts for one percent of visceral neoplasms. Annual incidence varies from 0.5 to 10 cases per 100,000 people.<sup>[1]</sup> Papillary carcinoma of thyroid (PCT) is the most frequent type of DCT. Overall survival at ten years is 95% in patients under 40 years of age and 75% in older patients.<sup>[2]</sup> Despite the presence of distant metastases, the patients frequently survive for several years without treatment. Lung is the most common site of metastasis followed by bone. Incidence of paranasal sinus (PNS) metastasis is very low in case of thyroid carcinoma and only a handful of cases are reported.

## CASE REPORT

A 45 year old male presented with nasal obstruction, epistaxis, proptosis and decreased vision in left eye for three

months. He reported having subtotal thyroidectomy two years back for follicular variant of papillary carcinoma of thyroid [Figure 1]. Postoperative radioiodine scan showed increased concentration in skull base and left orbit. Patient was on radioactive iodine therapy, and had received 900 millicurie of radioiodine in six sessions over a period of two years. His physical examination revealed a large mass in the left side of nasal cavity with proptosis of left eye. Zero degree endoscopy showed bilateral nasal cavity mass, with a bulge in sphenothmoid and nasopharynx.

A contrast enhanced computed tomography (CECT) scan of PNS showed a large heterogeneously enhancing mass in the superior nasal cavity causing destruction of nasal septum. Erosion of sphenoid and ethmoid sinus, destruction of sphenoid wing, involvement of cavernous



**Figure 1:** Photomicrograph from thyroidectomy specimen showing microfollicles lined by cells displaying nuclear enlargement, overlapping and nuclear clearing (H and E, x100). Higher-power photomicrograph further highlights the nuclear features (Inset x200)

### Access this article online

#### Quick Response Code:



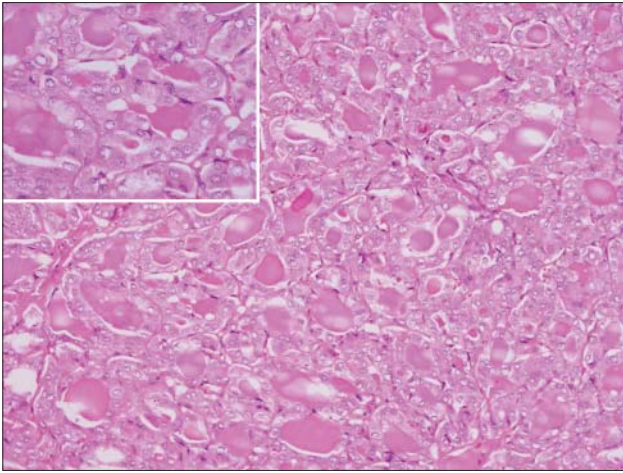
#### Website:

www.ccij-online.org

#### DOI:

10.4103/2278-0513.110817

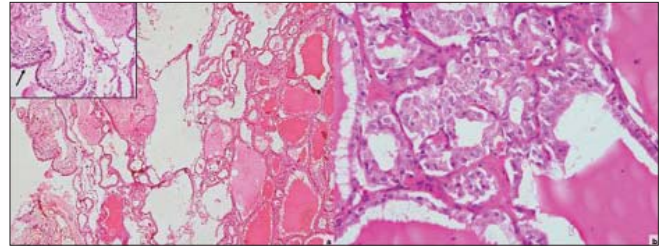
**Address for correspondence:** Dr. Renu Madan, Department of Radiation Oncology, All India Institute of Medical Sciences, New Delhi, India.  
E-mail: renumadan10@yahoo.com



**Figure 2:** CECT PNS showing a large heterogeneously enhancing mass in nasal cavity causing destruction of nasal septum, erosion of nasal turbinates, involvement of sphenoid, ethmoid sinuses, cavernous sinus with internal carotid artery encasement and minimal extension to anterior and middle cranial fossae, infratemporal space and pterygoid muscle invasion, and erosion of left half of palatine bone and adjoining part of maxillary alveolar arch with minimal extension into oral cavity were noted. The mass was causing expansion and displacement of medial walls of both orbits with consequent bilateral proptosis, more on left side

sinus and expansion of medial wall of both orbits were noted [Figure 2]. Biopsy from the nasal mass suggested metastatic thyroid carcinoma [Figure 3].

Since he had already received several sessions of radioiodine ablation and had failed, he was considered for palliative radiation therapy, 30 gray in 10 fractions over two weeks to the PNS mass. CECT of the PNS eighteen months following



**Figure 3:** Legend for Nasal Metastasis of Thyroid Carcinoma: Photomicrographs showing nasal mucosa (inset, arrow) with underlying colloid-containing follicles (a, H and E, x40). Higher-power view shows follicles lined by cuboidal cells with nuclear enlargement, dispersed chromatin (Orphan Annie eye-like) and inspissated colloid (b, H and E, x200)

**Table 1: Reports on paranasal sinus (PNS) metastases from thyroid malignancies in english literature and reported therapy with outcome**

Histology	Reference	Site of metastases	Treatment	Outcome
Follicular carcinoma thyroid	Cinberg 1980	-Maxillary -L1 vertebrae -Pulmonary nodules (on radioactive iodine scan)	Oral ablation of radioactive iodine (once)	Free from epistaxis for one year. (further information NA)
	Chang 1983	Sphenoid	NA	NA
	Renner 1984	Sphenoid	NA	NA
	Cumberworth 1994	Sphenoid, frontal, maxillary	Total thyroidectomy followed by Iodine ablation	Asymptomatic for 12 years and then developed paraplegia. On radioiodine scan there was increase uptake in PNS and T11-12 vertebrae. Biopsy suggestive of follicular carcinoma. She died after one week from disseminated metastatic disease. NA
	Yamasoba 1994 <sup>[10]</sup>	Ethmoid, sphenoid, maxillary	Embolization→ removal of PNS mass → total thyroidectomy	NA
	Altman 1997 <sup>[9]</sup>	Sphenoid, ethmoid, base/clivus	Palliative EBRT to base of skull→completion thyroidectomy→I131	Died at 1 year
	Hefer 1998	maxilla	TT → left maxillectomy → brachytherapy	NED at 2 years
Papillary carcinoma thyroid	Coca Pelaz 2009	Infratemporal fossa, sphenoid	Excision of infratemporal tumor → TT → I-131 ablation	NED at 6 years
	Chang 1983	sphenoid	NA	NA
	Freeman 1996	Sphenoid, ethmoid	TT → I-131 ablation → EBRT	NA
	Bhansali A 2003	Maxillary	TT	lost to follow up
	Argibay Vázquez S 2005	sphenoid	TT → I131→ partial resection of PNS mass→ EBRT 57 Gy→ I131	Stable disease at 3 years

NA: Not available, NED: No evidence of disease, PNS: Paranasal sinus, TT: Total thyroidectomy, EBRT: External beam radiation therapy

radiation therapy did not reveal any significant change compared with baseline imaging thus having stable disease.

## DISCUSSION

Differentiated thyroid cancer accounts for >90% of cases of thyroid cancer, with most patients have excellent prognosis. Among well differentiated carcinomas, 80-85% are papillary, 10-15% are follicular, and 3-5% are Hurthle cell carcinoma.<sup>[3]</sup> Morphologic variants of PTC include sclerosing type, solid variant and follicular variant. Clinical behavior of follicular variant is similar to PTC except that these tumors are small, spread via hematogenous route rather than lymphatics as seen in PTC, and have a higher incidence of lung metastases.<sup>[4]</sup>

Distant metastases are seen at presentation in 7-15% patients with DCT. Lung is the most common site of metastases (65-70%) followed by bone.<sup>[5]</sup> Other less frequent sites of metastases are brain, liver and skin.

Metastases to PNS are fairly uncommon, with a literature review from Germany listing 169 cases in 123 reports. Among these, thyroid gland was reported as the 4<sup>th</sup> commonest site of origin, this particular report listing 13 such cases.<sup>[6]</sup> The most commonly affected PNS was maxillary sinus followed by sphenoid. Altman described 11 cases of metastatic thyroid cancers to PNS in a literature review.<sup>[7]</sup> In most of these patients, histology of the primary was follicular thyroid carcinoma. Epistaxis was the most common symptom which was attributed to the hypervascular nature of thyroid tumor metastasizing to PNS.<sup>[8]</sup> Bernstein, *et al.* described the review of 82 cases of PNS metastases. Forty patients had metastases in maxilla, 15 in ethmoid, 12 in frontal and six in sphenoid sinus. In 55% patients, primary site was identified as kidney. Thyroid primaries contributed only three cases.<sup>[9]</sup> Barrs *et al.* reviewed a series of eight patients with PNS metastases, two from prostate, two from myeloma, one from each kidney, lung, breast and follicular carcinoma thyroid.<sup>[10]</sup>

Outcome for PTC is highly favorable. Presence of metastases at presentation reduces five year survival to 40% compared to 99% for non-metastatic disease. Patients with PNS metastases from DCT, however, behave in a more benign

fashion, with reports showing long term survival rates of 3-5 years even in the presence of residual or stable disease following radiation therapy. A summary of major reports on thyroid malignancies with PNS metastases is given in Table 1.

## CONCLUSION

PNS metastases from thyroid cancer are rare but in known or suspicious thyroid cancer, one should keep the possibility of PNS metastases in mind and if PNS metastases are diagnosed, they should be vigorously treated with I<sup>131</sup> or EBRT, as such therapy has been seen to stabilize symptoms for long intervals. Surgical approach is usually difficult in view of the cosmetic and functional concerns but may be considered in selected cases.

## REFERENCES

1. Ferrer JC, Merino JF, Ponce JL, Pinon F. Unusual metastasis of differentiated thyroid carcinoma. *An Med Interna* 2002;19:579-82.
2. Argibay Vázquez S, Lancha Hernández C, Martínez Muñoz Á. Metastases in the sphenoidal sinus in a patient with papillary thyroid cancer. *Clin Transl Oncol* 2005;7:324-7.
3. Jossart GH, Clark OH. Well-differentiated thyroid cancer. *Curr Probl Surg* 1994;31:933.
4. Carcangiu ML, Zampi G, Pupi A, Castagnoli A, Rosai J. Papillary carcinoma of thyroid. A clinicopathologic study of 241 cases treated at university of Florence, Italy. *Cancer* 1985;55:805-28.
5. Schlumberger MJ. Papillary and follicular thyroid carcinoma. *N Engl J Med* 1998;338:297-307.
6. Prescher A, Brors D. Metastases to the paranasal sinuses: Case report and review of the literature. *Laryngorhinootologie* 2001;80:583-94.
7. Altman KW, Mirza N, Philippe L. Metastatic follicular thyroid carcinoma to paranasal sinus, a case report and review. *J Laryngol Otol* 1997;111:647-51.
8. Yamasoba T, Kikuchi S, Sugawara M, Higo R, Sasaki T. Occult follicular carcinoma metastasizing to the sinonasal tract. *ORL J Otorhinolaryngol Relat Spec* 1994;56:239-43.
9. Bernstein JM, Montgomery WW, Balogh K. Metastatic tumors of the maxilla, nose, and paranasal sinuses. *Laryngoscope* 1966;76:621-50.
10. Barrs DM, McDonald TJ, Whisnant JP. Metastatic tumors to the sphenoid sinus. *Laryngoscope* 1979;89:1239-43.

**Cite this article as:** Madan R, Goyal S, Dinda AK, Maohanti BK. Papillary carcinoma of thyroid with paranasal sinus metastases. *Clin Cancer Investig J* 2013;2:90-2.

**Source of Support:** Nil, **Conflict of Interest:** No.