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RESEARCH ARTICLE

TALL CELL VARIANT PAPILLARY THYROID CARCINOMA IN A PEDIATRICPATIENT: A CASE REPORT AND REVIEW OF THE LITERATURE

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Abstract

Paediatric thyroid cancer is uncommon and classical papillary carcinoma is the most represented histological type. Variant high cell papillary carcinoma (VHCPC) is an extremely rare entity in the paediatric age group, aggressive and a marker of poor prognosis, as well as poor survival. The presence and percentage of a minority high cell contingent should be mentioned in the histopathological report. We report the case of a 9-year-old female patient with no previous history of cancer who presented with a 5 cm long left cervical nodule. Macroscopic examination showed the presence of several poorly bounded, fleshy, homogeneous beige coloured, non-encapsulated nodules. On microscopic examination, the tumour showed a papillary, focally solid architecture. The tumour cells were 2-3 times taller than they were wide, with abundant eosinophilic cytoplasm, sharp borders, and oval nuclei, with incisions and numerous intranuclear pseudo inclusions. The tumour protruded beyond the thyroid capsule and came into contact with the surgical borders, with the presence of vascular emboli. Our work aims to highlight the anatomopathological and diagnostic particularities of this sub-variant of papillary carcinoma.

Introduction:-

Pediatric thyroid cancer is uncommon and papillary carcinoma is the most common histological type.

Tall cell variant papillary carcinoma (CPVTC) is a rare, aggressive entity with a poor prognosis and is extremely rare in the pediatric age range.

Case Observation:-

We report the case of a 9-year-old female patient with no personal or family history, who consulted her doctor for an increase in volume in the neck.

During the clinical examination, the doctor discovered the presence of a left cervical nodule.

He indicated a thyroid ultrasound which showed a hypertrophy of the left thyroid lobe with the presence of a nodule measuring 5 cm in length, heterogeneous, hyperechoic, lobulated, and hypervascularized.

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A thyroid cytopunction was performed, the cytological interpretation of which was inconclusive.

A left isthmolobectomy was performed.

-On gross examination, there were several poorly bounded nodules, with a main lobar nodule of 5 cm. These nodules were fleshy, homogeneous beige in color, and not encapsulated [Figure 1].

-On microscopic examination, the tumor was multifocal and infiltrative.
It had a papillary, focally solid architecture [Figure 2].The tumor cells were 2-3 times taller than they were wide, with abundant eosinophilic cytoplasm, sharp borders, oval nuclei, frosted chromatin, incisures, and numerous intranuclear pseudo-inclusions. Mitotic activity was estimated at a maximum of two mitoses per 10 HPF (10 fields at high magnification X400) [Figure 3].

The tumor protruded through the thyroid capsule [Figure 4], and came into contact with the surgical margins and with the presence of vascular emboli [Figure 5].

Figure 1:- Left isthmolobectomy specimen. The presence of several nodules is poorly limited, beige, heterogeneous, and not encapsulated.

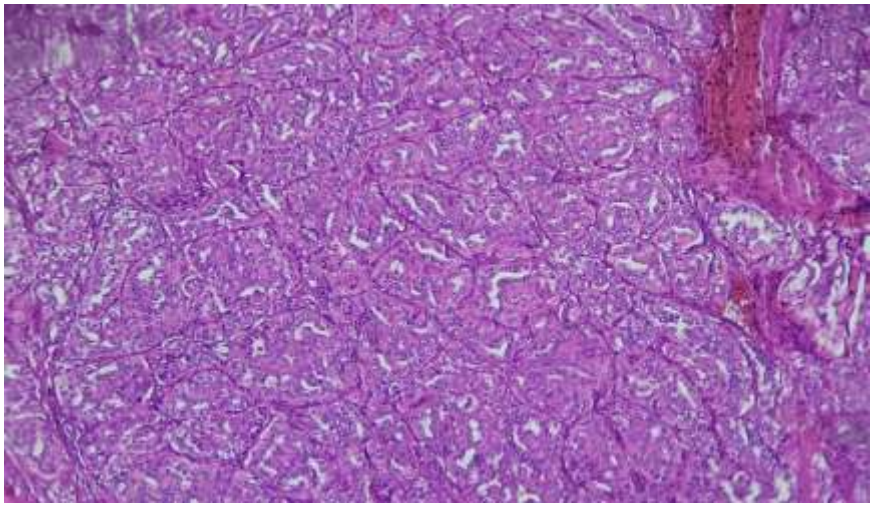

Figure 2:- Tumor showing solid, compact architecture. X10.

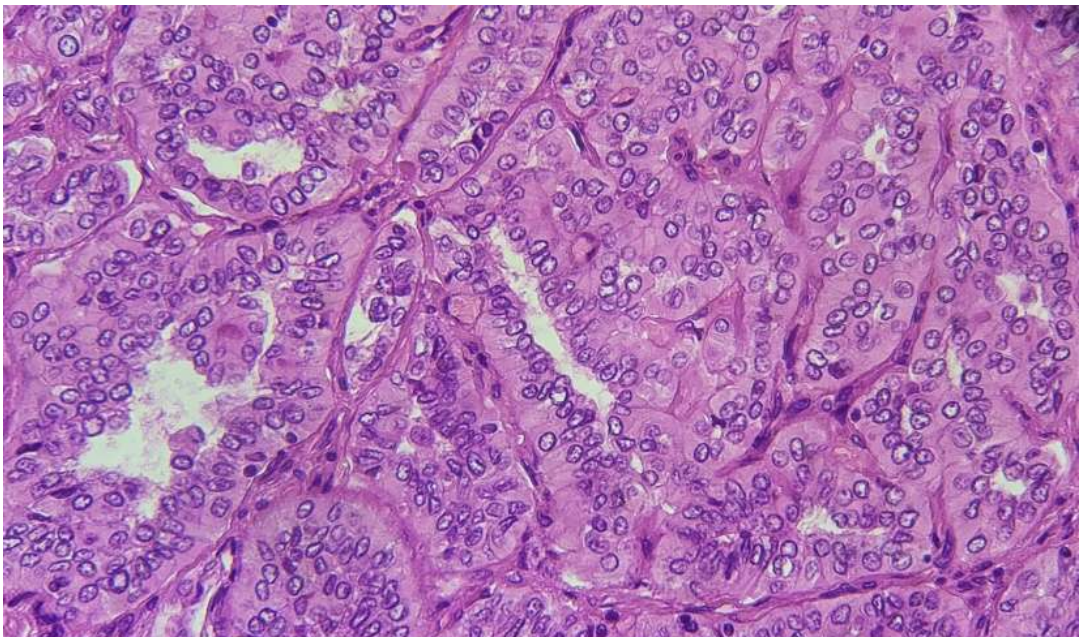

Figure 3:- Cells 2-3 times taller than they are wide, abundant cytoplasm, eosinophilic, sharp boundaries, oval nuclei, with frosted chromatin, incisures, andintranuclearpseudo inclusions. X 40.

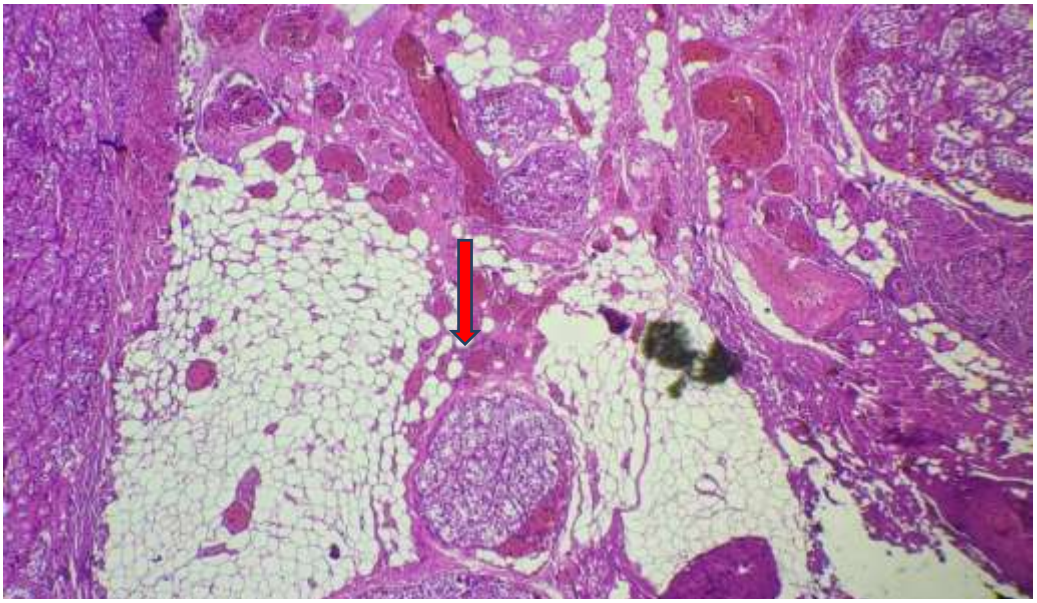

Figure 4:- Extra-thyroidal extension, in the musculo-fatty tissue. X10.

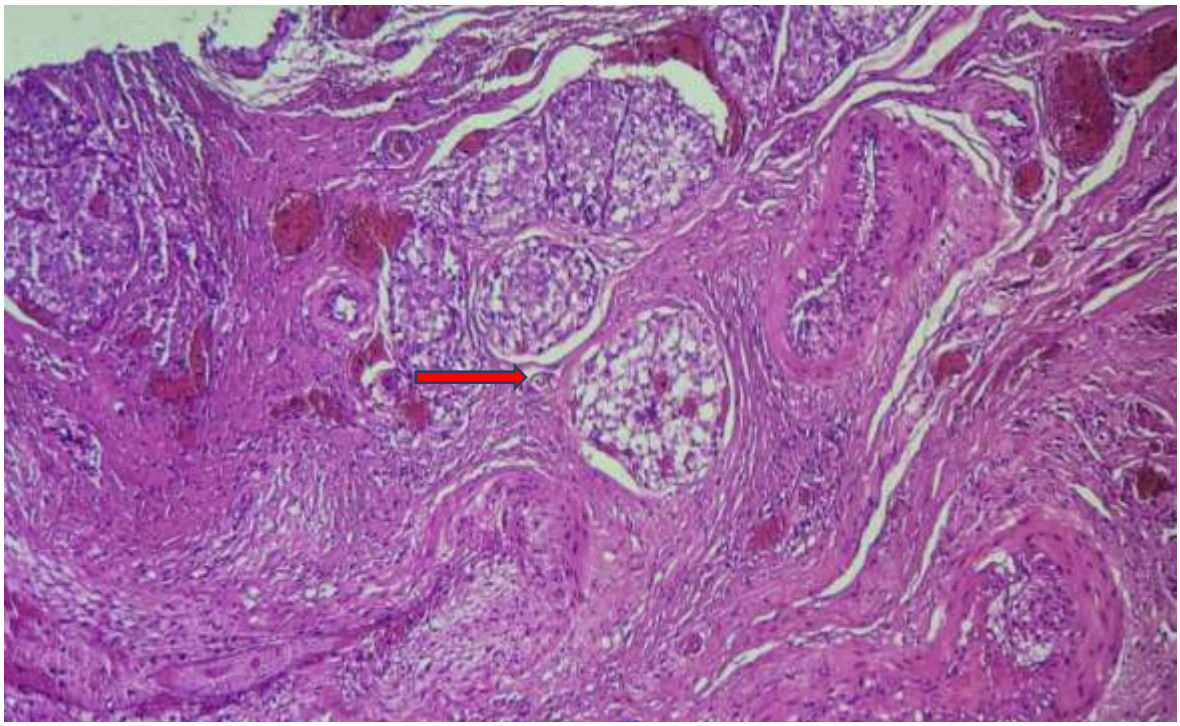

Figure 5:- Vascular emboli. X10.

Discussion:-

The high-cell variant of papillary thyroid carcinoma was first described by Hawks and Hazard in 1976, initially defined as a papillary carcinoma with more than 30% high cells, the cells being twice their height [1].

The high cell variant accounts for 5-10% of papillary thyroid cancers [2].
While the incidence of classical papillary carcinomas has increased by 60% over 20 years, the incidence of the high-cell variant has increased by 158% over the same period [3].

The World Health Organization (WHO) defines this variant as a tumor composed of cells that are two to three times the size of the width and have abundant eosinophilic (oncocytic) cytoplasm [4]. These high cells are frequently present in conventional papillary carcinomas, they must represent more than 30% of all tumor cells to be diagnosed as a high-cell variant.

This definition differs from the 2004 WHO classification which defined it as a tumor "predominantly composed" of neoplastic cells with a height/size ratio of 3:1.

The percentage of high cells required to make a diagnosis of the high cell varies between studies: Ganly et al [5] recommend at least 30%, Beninato et al [6], and Oh et al [7] suggested that more than 10% high cells are an aggressive variant.

Compared to classic papillary carcinoma, the high cell variant occurs in older patients, with more frequent overgrowth of the thyroid capsule and poorer 5-year specific survival (82% in the high cell variant versus 98% in classic papillary carcinoma) [8].

Morris et al. observed a poorer prognostic impact, in terms of specific survival, of the high cell variant after analyzing a large series of 278 cases of high cell carcinoma matched with classic papillary carcinoma according to age, sex of the patients, presence or absence of an extrathyroidal extension, presence or absence of regional or distant metastases, type of surgery and adjuvant treatment as well as the year of diagnosis [8].

They found that the identification of the high cell variant was a marker of poorer patient-specific survival [8].

These results should encourage the treating clinician to monitor the patient closely after treatment, given the high aggressiveness of these tumors and that their presence and the percentage of a minority high cell contingent should be mentioned in the histopathological report.

In CPVTC, the tumor cells have abundant, eosinophilic, dense, lacquer-like cytoplasm with clear boundaries. The nuclear features of papillary carcinoma are numerous and distinct. The nuclei are oval, elongated along the long axis of the tumor cell, often irregular in outline, angular with marginal chromatin, and the presence of a small nucleolus pressed against the nuclear membrane. Numerous intranuclear pseudo inclusions, and invaginations of the cytoplasm within the nuclei, are observed [2,9].

The tall cell variant differs from the warthin-like variant and the columnar cell variant of papillary carcinoma.

The warthin-like variant has a lymphocyte-rich tumor stroma and is most often seen in the context of chronic thyroiditis [10].

In this columnar cell variant, the nuclei are oval and hyperchromatic [4].

In the molecular features, the role of the BRAFV600E mutation in the columnar cell variant has been studied. It was found that the prevalence of the BRAFV600E mutation is between 80 and 100%.

Wong et al [11] found that the highest frequency of BRAF mutations was found in cases with more than 50% high cells and that these cases often have a secondary pathogenic mutation (usually in the TERT promoter gene). RET/PTC rearrangements have also been studied, with RET/PTC3 described in 35.8% of cases compared to 17.2% in classical papillary carcinoma [12, 13, 14].

Given the perplexity of the independent prognostic value of this aggressive variant, it is important to rely on established prognostic features (such as large size, extrathyroidal extension, and extensive vascular invasion) to decide on the extent of surgery or the need for adjuvant therapy. Thus, treatment may range from a simple lobectomy for an intrathyroidal tumor to total thyroidectomy with lymph node dissection and with or without irradiation for a tumor with extrathyroidal extension. The basic surgical principle of 'gross total excision', with R0 resection where possible, should remain the norm [15].

Conclusion:-

CPVTC is one of the aggressive forms, a marker of poor prognosis as well as poor survival of papillary carcinoma. The presence and percentage of a minority contingent of high cells should be mentioned in the histopathological report.

The identification of new molecular targets and the development of new therapeutic agents will allow the exploration of the efficacy of new systemic therapies and improved outcomes through clinical trials.

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