

Original Research Article

Incidental and rare findings in thyroidectomy specimens

N. Sreemani Kumari^{1*}, Seema Afroze², Madhavi Parigi³

¹Professor, ²Senior Resident, ³Senior Resident

Department of Pathology, Government ENT Hospital, Osmania Medical College, Hyderabad, Telangana, India

*Corresponding author email: nsmk13959@gmail.com

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Abstract

Background: We have reported three cases of incidental findings of solid cell nests, ectopic thymus with parathyroid tissue and thyrolipoma in thyroidectomy specimens. These patients presented clinically as nodular thyromegaly and were directed for FNAC. Ultrasound findings were suggestive of nodular goiter and on histopathology revealed features compatible with nodular goiter along with incidental findings of solid cell nests, ectopic thymus with parathyroid tissue and thyrolipoma. Differential diagnosis of thyroid nodules should include these rare diagnostic findings which create confusion in thyroid pathology as they mimic malignancies both clinically and histologically and also because neoplasms may arise in the background of these rare findings.

Objectives: To analyze clinicopathological findings in thyroid specimens, to correlate with Ultrasonography (USG), Fine needle aspiration cytology (FNAC), hormonal assay and immunohistochemistry.

Materials and methods: All the specimens were analyzed and routinely processed for histopathology and stained with haematoxylin and eosin.

Results: Incidental associated findings were noted in three cases composed of solid cell nests, ectopic thymus with parathyroid tissue and thyrolipoma.

Conclusion: Three incidental and relatively unusual findings of solid cell nests, ectopic thymus with parathyroid tissue and thyrolipoma were diagnosed on histopathology. These lesions of thyroid gland must be differentiated from close mimickers including both non-neoplastic and neoplastic lesions clinically, radiologically and microscopically. Though benign and rare, these incidental findings should be thought of in all the thyroid specimens to avoid confusion with neoplastic thyroid pathology and also because they carry a potential risk for developing into neoplastic lesions.

Key words

Solid cell nests, Ectopic thymus, Thyrolipoma, Histopathology, Immunohistochemistry.

Introduction

Incidental findings in thyroid specimens include solid cell nests, intrathyroidal thymic tissue, parathyroid tissue, lipoma, adenolipoma, thyrolipomatosis, liposarcoma, micropapillary carcinoma and amyloid goiter [1]. To avoid misdiagnosis of these incidental findings with other malignancies in thyroid proper, correlation with clinical, ultrasound and immunohistochemistry is required to arrive at accurate diagnosis. We report three incidental and unusual cases of solid cell nests, intra thyroid thymic tissue with parathyroid tissue and thyrolipoma. A brief literature and differential diagnosis are discussed.

All the three cases presented to the hospital with a history of gradually enlarging, painless swelling in the anterior neck region, moving with deglutition. On ultrasound all the cases were suggestive of nodular goiter. Routine investigations and thyroid function tests were within normal limits. Fine needle aspiration cytology in all the cases revealed features compatible with nodular goiter.

Materials and methods

Objectives of the present study were to analyze clinicopathological findings in thyroid specimens, to correlate with Ultrasonography (USG), Fine needle aspiration cytology (FNAC), hormonal assay and immunohistochemistry.

All the specimens were analyzed and routinely processed for histopathology and stained with haematoxylin and eosin.

Case 1

First case was a 38 year old male presented with ultrasound findings of multinodular goiter with foci of calcification. On gross examination, the specimen weighed approximately 18.3 grams and measured 5.5x4x3 cm. The cut surface showed multinodular configuration with cystic and grey

white areas. Microscopically features of an adenomatoid goitre were noted revealing microfollicles, macrofollicles along with adjacent normal thyroid follicular areas intermingling with foci of calcifications, hyalinization, cystic changes and collections of haemosiderin laden macrophages. Also noted were small nests and islands of cells in the interfollicular areas having squamoid morphology showing polygonal cells with abundant eosinophilic cytoplasm lacking intercellular bridges and showing centrally placed nuclei. IHC staining revealed intense positivity with p63 and was negative for calcitonin (**Figures - 1 to 4**)

Case 2

A 42 year old female presented with mass lesion in the right lobe of thyroid. A right hemithyroidectomy was performed and specimen was sent for histopathological examination.

On gross examination, specimen weighed 14.6 grams and measured 4.5x3x1.4cm in dimensions. The cut surface revealed a well circumscribed cystic nodule that measured 2.5cm in maximum dimensions.

Microscopic examination revealed, a well circumscribed nodule composed of follicles of varying sizes and shapes lined by cuboidal epithelium filled with colloid, admixed with areas of hemorrhages and collections of histiocytes. Intermingling with these follicles, there were cells arranged in sheets showing clear cell morphology along with lymphoid tissue with Hassall's corpuscle like structures. Immunohistochemistry with CD1a revealed intense and diffuse positivity in the peripheral areas of the lymphoid tissue. (**Figures – 7 to 12**).

Case 3

Third case was a 65 year old female. Left thyroidectomy specimen, received was measuring 9x5x3 cm and weighing

approximately 65grams. Cut section showed grey brown to focal grey yellow areas. Microscopic examination revealed features of goiter intermingling with singly scattered and variable

sized lobules of mature adipose tissue in the interfollicular connective tissue stroma (**Figures – 5, 6**).

Figures 1&2 :10x & 40x views of H&E sections showing islands of solid cell nests surrounded by lymphocytes. Figures 3&4 : 10x & 40x views of IHC staining with p63 highlighting the main cells of solid cell nests. Figures 5&6 : 10x views of H&E sections showing islands & lobules of mature adipocytes intermingling with native thyroid follicles.

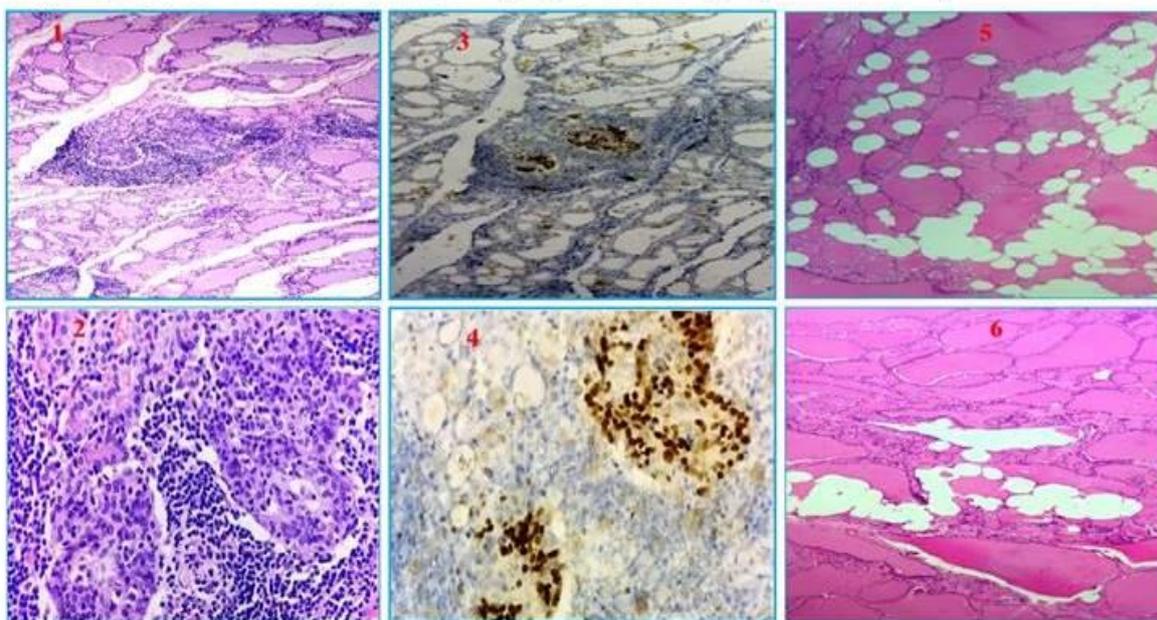
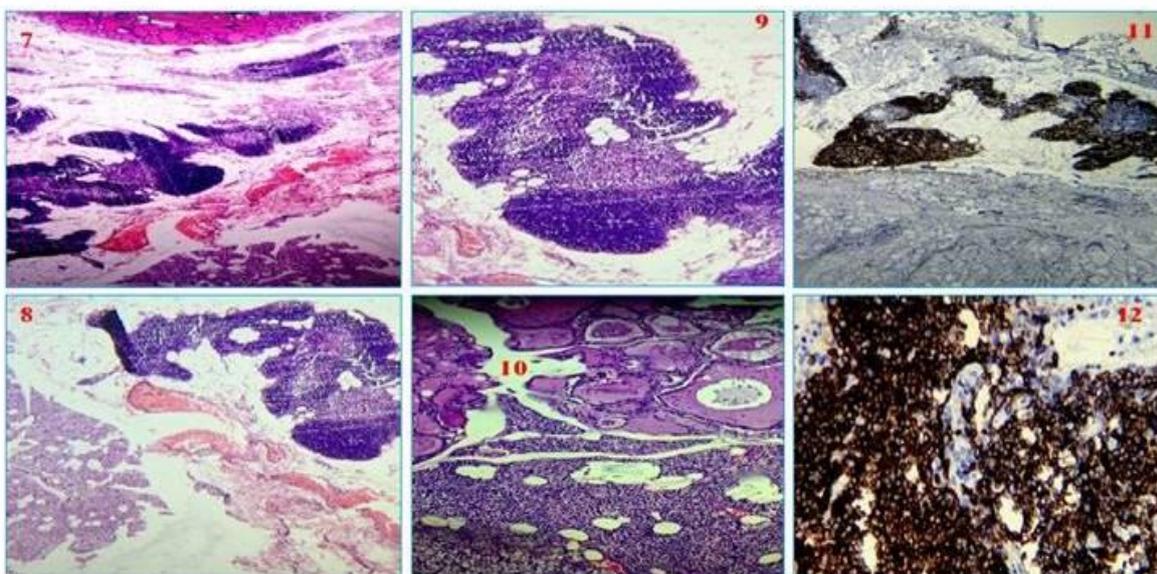


Figure 7-10 (H & E sections). Figure 7 : 4x view showing native thyroid tissue at the upper end, parathyroid tissue at the lower end and inbetween, lymphoid tissue with hassal corpuscle like structure compatible with thymic tissue is noted. Figure 8: 10x view showing intrathyroidal thymic and parathyroid tissues. Figure 9 : 40x view showing darker cortical and lighter medullary areas of thymus. Figure 10: 40x view showing intrathyroidal parathyroid tissue. Figure 11 & 12 : 10x & 40x views showing diffuse and intense staining with IHC marker CD1a in the cortical "T " cell areas of thymus.



Results

First case was diagnosed as solid cell nests (type 2), based on the squamoid nature of cells (**Figures – 1, 2**), intense IHC positivity for p63 in the main cells of the nests (**Figures – 3, 4**), while staining for calcitonin was found to be negative, possibly due to their paucity in number as described in the literature. Second case was diagnosed as intrathyroidal thymic tissue, based on the presence of Hassall's corpuscles (**Figure - 9**) and intense positive staining with IHC marker CD1a in the cortical "T" cell areas (**Figures – 11, 12**), along with parathyroid tissue, with classical clear cell morphology (**Figures – 8, 10**). Third case as thyrolipoma, due to the presence of lobules of mature adipocytes separating the thyroid follicles in nodular goitre (**Figures – 5, 6**).

Discussion

Incidental findings in thyroid are solid cell nests, intrathyroidal thymic tissue and parathyroid tissue, amyloid goiter, adenolipoma, lipomatosis, liposarcoma, papillary microcarcinoma thyroid and medullary microcarcinoma thyroid [1].

Present study revealed three different cases of incidental findings associated with nodular goiter in hemithyroidectomy specimens showing solid cell nests, intrathyroidal thymic along with parathyroid tissue, and thyrolipoma respectively.

Solid cell nests are also called ultimobranchial body remnants [2-8]. They mimic other thyroid lesions with squamous or squamous like differentiation, such as squamous metaplasia, primary or secondary squamous cell carcinoma, thyroglossal cyst, c-cell hyperplasia, papillary microcarcinoma, medullary microcarcinomas, thus posing problems in diagnosis.

Solid cell nests (SCN) are composed of a mixture of main cells and c-cells. Main cells are polygonal to elongated or spindle-shaped with eosinophilic cytoplasm, central nucleus showing nuclear grooving and squamoid features but lacking intercellular bridges [2-4]. C cells

constitute a minor population with clear cytoplasm and small nuclei [2-4]. Follicles lined by main cells and follicular cells, forming a follicular lumen like pattern are noted. This lumina are positive with periodic acid schiff staining [3, 5]. BRAF mutations in solid cell nest hyperplasia are associated with papillary carcinoma thyroid [9]. Solid cell nests are implicated as precursor for mucoepidermoid carcinoma [10].

Asioli, et al. [11] classified SCN into 4 types based on the solid (types 1 - 2) or cystic (types 3 - 4) patterns. Type 1 (florete-like) is composed of main cells, characterized by round to oval or elongated cells with scant cytoplasm, centrally located oval to fusiform nuclei, and occasional nuclear grooves. The cells form round to oval groups, surrounded by lymphocytes. Type 2 SCN (epidermoid-like) are made of larger, polygonal cells with an epidermoid appearance. Type 3 has cystic architecture lined by flattened or polygonal cells. Type 4 SCNs (mixed follicles) have a follicular appearance and contain both follicular epithelium and small main cells. Solid cell nests can be diagnosed on histomorphology and sometimes they can mimic many thyroid malignancies with squamoid differentiation and thus need IHC for confirmation. Immunohistochemical staining with p63 and TTF-1 are positive in main cells, while calcitonin positivity is noted in c-cells. They are negative for thyroglobulin. P63 can be useful in distinguishing solid cell nests from other mimics like medullary and papillary microcarcinomas [12].

Thymic tissue during embryogenesis may be located along the pathway from angle of the mouth or the base of the skull to the superior mediastinum [13, 14]. Failure of descent of thymus appears as remnants or nodules in the cervical region from the angle of the mouth to the thyroid. Thyroid is the most common site for ectopic thymus and other sites are base of skull, middle ear, tonsil, submandibular gland, posterior aortic arch and skin surrounding a bilateral cleft lip [15]. Ectopic thymus is

common in children [16, 17]. Intrathyroidal thymic tissue is common in children usually presenting as nodular enlargement of thyroid [18]. Figueroa, et al. [19] reported two cases with intrathyroidal ectopic thymic tissue on cytology. Radiologically, especially on USG, calcifications may mimic and may be misdiagnosed as papillary carcinoma thyroid.

Intrathyroid thymic tissue is seen in children. In our study, second case was a female patient of 42 years, the occurrence in adults is rare and this finding correlated with other studies [20-23]. It is important to diagnose and remove them surgically as intrathyroidal thymic and parathyroid tissues carry a potential risk for developing into neoplastic lesions [20-23], like thymoma or thymic carcinoma and parathyroid adenoma or carcinoma respectively.

Mature fat-containing lesions of the thyroid are uncommon phenomenon, encompassing several clinical-pathological conditions such as adenolipoma, thyrolipoma, thyrolipomatosis, amyloid goiter, lipoma, liposarcoma of thyroid gland and associations with papillary carcinoma, hyperthyroidism and lipid rich cell adenomas of thyroid gland [1, 24]. Histo and immunohistochemistry may be needed to rule out associated lesions. Congo red stain for amyloid goiter, CK19 for papillary carcinoma thyroid and hormonal assays revealing increased T3 and T4 titres and decreased TSH levels for hyperthyroidism, confirm the diagnosis [25]. Adenolipoma and thyrolipoma are nodular, well circumscribed lesions with mature adipose tissue associated with follicular adenomas and nodular goiter respectively, while thyrolipomatosis is a diffuse lesion with intermingling of native thyroid follicles with mature adipose tissue [26].

Conclusion

In conclusion, thyroid swellings including solid cell nests, ectopic intrathyroidal thymus and thyrolipoma, though rare and benign should be included in the differential diagnosis to avoid misdiagnosis of malignancies. USG and other

imaging studies are nonspecific and inconclusive suggesting difficulty in the diagnosis preoperatively. Confirmative diagnosis can be made accurately based on histomorphology and substantiation with immunohistochemistry.

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