CASE REPORT

Case Report: Multifocal non-invasive follicular thyroid neoplasm with papillary-like nuclear features presenting in a female child [version 1; peer review: awaiting peer review]

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Abstract
Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) was introduced as a separate entity by the World Health Organization in 2017 with strict inclusion and exclusion criteria. Most NIFTP cases have been reported in adults and few cases have been diagnosed in children. Here, we present a classic case of NIFTP affecting a 10-year old female child. We also review previous reports of NIFTP in children regarding size, focality, nodal metastasis, recurrence, type of operation and follow-up data. The present report adds a new case of NIFTP in the paediatric age group characterized by multifocality, absence of nodal invasion and indolent course until last follow-up, recommending less aggressive management.

Keywords
NIFTP, children, multifocality

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Introduction
Generally, the diagnosis of papillary thyroid carcinoma (PTC) has increased over the past several decades, partly due to increased recognition of the follicular variant of PTC. The subjectivity in diagnosis of this variant and the indolent behaviour of encapsulated or non-invasive forms, led to revision and follow-up of a large number of these cases by international multidisciplinary collaborative group. Consequently, the encapsulated variant of PTC was reclassified as non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP), which had strict inclusion and exclusion criteria for this diagnosis. The term NIFTP was then introduced as a separate entity by the World Health Organization in 2017, with a category of follicular tumour of uncertain malignant potential and well-differentiated tumour of uncertain malignant potential. The majority of NIFTP reports have been in adults. Here, we present a classic case of NIFTP affecting a 10-year old female child.

Case report
A female patient of 10 years presented to our department with an enlarged thyroid that had been observed by her mother. No previous relevant family history was recorded.

Ultrasound revealed two suspicious nodules on the right side of the thyroid lobe. No pathological lymph node enlargement was reported. Ultrasound guided fine needle aspiration cytology was performed and the results showed sheets of follicular epithelial cells, including some which were rounded and others that were elongated with occasional grooved nuclei and inclusions (Figure 1A). This was diagnosed as atypical thyroid lesion indefinite for malignancy (THY3a).

The patient was submitted for total thyroidectomy within one month from her first presentation. On resection, the right thyroid lobe revealed a well-circumscribed capsulated nodule formed of microfollicles, lined by follicular epithelial cells with wide-spread nuclear features of papillary thyroid carcinoma (Figure 1C). There was no evidence of capsular or vascular invasion, true papillae, trabeculae or solid arrangement. The patient did not receive any specific medications before surgery and she was followed up for 12 months with no evidence of recurrence or nodal involvement.

Discussion
Most NIFTP cases have been previously reported in adults and data concerning this diagnosis in children is scarce; only 21 cases in children have been reported in the English literature within the last two years (Table 1). Preoperative diagnosis of our case was based on ultrasound data and the cytology was not obviously malignant. NIFTP cytology is commonly interpreted as indeterminate (categories III and IV according to Bethesda system), followed by suspicion for malignancy. Although the above findings would suggest lobectomy, our patient was submitted for total thyroidectomy and as has been done in previously reported cases.

The current report demonstrated a classic case of NIFTP affecting a young female child, agreeing with previous reports that there are more cases in women than men (Table 1). Although not common, multifocality has been reported previously for NIFTP in adults and in children. The size of NIFTP lesion is usually small, rarely exceeding 2 cm in diameter.

More aggressive therapy is recommended for PTC in childhood and adolescence but the indolent behaviour reported for NIFTP necessitates less aggressive management in children, as well as adults. Therefore, completion lobectomy is not recommended for postoperative cases diagnosed as NIFTP. NIFTP in children has a similar outcome as cases reported in adults, suggesting that paediatric NIFTP behaves indolently, as evidenced by the absence of local recurrence and nodal metastasis.

The present report adds a new case of NIFTP in the paediatric age group characterized by multifocality, absence of nodal invasion and indolent course - until last follow-up, recommending less aggressive management of this disease.

Figure 1. Right thyroid lobe results from patient. (A) Cytologic features of fine needle aspiration cytology showing cohesive sheet of follicular epithelial cells, including some which were rounded and others that were elongated with occasional grooved nuclei (hematoxylin and eosin, mag. x600). (B) Gross picture of affected right lobe after total thyroidectomy showing two well circumscribed whitish nodules. (C) Histopathological examination of nodule of resected thyroid revealing a capsulated nodule formed of microfollicles lined by follicular epithelial cells, which had enlarged pale crowded nuclei together with nuclear grooves and inclusions (nuclear features of papillary thyroid carcinoma)(hematoxylin and eosin, mag. x400).
Table 1. Characteristics of reported non-invasive follicular thyroid neoplasm with papillary-like nuclear features in children.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Gender F:M</th>
<th>Size (cm)</th>
<th>Focality</th>
<th>Recurrence</th>
<th>Metastasis</th>
<th>Operation</th>
<th>Follow up (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wang et al., 2019 (3 cases)</td>
<td>16–17</td>
<td>2:1</td>
<td>0.4–3.1</td>
<td>Single</td>
<td>No</td>
<td>No</td>
<td>Total thyroidectomy 15–138</td>
</tr>
<tr>
<td>Rosario and Mourão, 2018 (4 cases)</td>
<td>9–15</td>
<td>3:1</td>
<td>1.7–2.4</td>
<td>Single</td>
<td>No</td>
<td>No</td>
<td>Total thyroidectomy 24–108</td>
</tr>
<tr>
<td>Rossi et al., 2018 (2 cases)</td>
<td>&lt;19</td>
<td>1:1</td>
<td>&lt;2 &gt; 2</td>
<td>Single</td>
<td>No</td>
<td>No</td>
<td>NA 84</td>
</tr>
<tr>
<td>Mariani et al., 2018 (10 cases)</td>
<td>14.4</td>
<td>3:5:1</td>
<td>2.1</td>
<td>7 cases single 3 cases multifocal</td>
<td>No</td>
<td>2 cases with lymph node metastases</td>
<td>Total thyroidectomy NA</td>
</tr>
<tr>
<td>Samuels et al., 2018 (2 cases)</td>
<td>14</td>
<td>2:1</td>
<td>1.1–4.5</td>
<td>NA</td>
<td>No</td>
<td>No</td>
<td>Total thyroidectomy NA</td>
</tr>
<tr>
<td>The current case</td>
<td>10</td>
<td>Female</td>
<td>1.5–2</td>
<td>Multifocal</td>
<td>No</td>
<td>No</td>
<td>Total thyroidectomy 12</td>
</tr>
</tbody>
</table>

F:M, female to male ratio, NA: not available

Consent
Written informed consent was obtained from the patient’s father for the publication of this case report and any associated images.

Data availability
All data underlying the results are available as part of the article and no additional source data are required.

References

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