Papillary thyroid cancer (PTC) is the most common thyroid tumor in childhood and adolescence. Most of these patients are referred with locally advanced and/or distant disease at the moment of diagnosis. Whenever possible, these patients should be offered total thyroidectomy and radioiodine remnant ablation; however, this approach is not always possible to perform, rendering these tumors unresectable. These critical cases could benefit from neoadjuvant treatment with multikinase inhibitors (MKI) so the standard treatment can be performed. Lenvatinib is an MKI recently approved in many countries throughout the world for the treatment of radioiodine refractory adult differentiated thyroid cancer. MKI showed relevant and rapid shrinkage of tumoral lesions, probably due to high affinity for VEGF-R2. Only few pediatric cases have been reported.

Case Report

Female patient, 10 y.o. with locally advanced PTC and metastasis to the lungs, who required 3 liters of oxygen due to respiratory failure caused by bilateral miliary lung disease, mistakenly treated as tuberculosis two months previously and referred to our Hospital.

A large thyroid mass adhered to deep tissues was corroborated with a CT scan, which showed a large heterogeneous neck mass with multiple microcalcifications associated with multiple lymph nodes. Both lungs had multiple micro-nodular disease with interstitial involvement. Total thyroidectomy together with lymph-node dissection was planned, but the extensive local infiltration made the lesion unresectable and surgery was limited to a thyroid biopsy.

The patient required respiratory assistance. Pathological examination confirmed the presence of a PTC with a rearrangement of the RET-PTC3 oncogene.

Eight days after surgery, the patient was critical... and compassionate use Lenvatinib because this MKI showed a relevant and rapid shrinkage of tumoral lesions. The patient was started on oral lenvatinib at a dose of 14 mg daily (14 mg/m2/day). Three days later, the patient clinically improved and nine days post-lenvatinib initiation, the patient was discharged from hospital with 10 mg daily of lenvatinib without need for oxygen therapy.

Evolution parameters under Lenvatinib treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Time (months)</th>
<th>Thyroid ultrasound</th>
<th>CT scan</th>
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<tbody>
<tr>
<td>Baseline</td>
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<td>4 months</td>
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Imaging studies:

After four months on Lenvatinib the thyroid mass appeared stable and pulmonary nodules appeared stable to slightly smaller without evidence of new or progressive disease.

Conclusion

On lenvatinib treatment, our patient showed frank clinical improvement, arrest of disease progression, and stable disease on imaging studies.

This case shows that lenvatinib may be a beneficial option for children with advanced PTC not amenable to surgery/RAI treatment and may be used as a bridge to these first-line therapies.