Endocrine cancer

Definition
In 2011, the National Cancer Institute estimates that in the United States there will be 48,000 new cases of thyroid cancer and 1,700 deaths (Thyroid cancer). The thyroid is a butterfly-shaped gland that is positioned beneath the Adam’s apple. The thyroid creates hormones that manage the heart rate, blood pressure, body temperature and weight. Thyroid cancer occurs when cancerous cells within the thyroid gland grow in an uncontrollable manner (Discovermi.org - SNM, 2011).

Four types of thyroid cancer are papillary, follicular, medullary, anaplastic and thyroid lymphoma (Thyroid cancer). Other endocrine cancers include parathyroid and adrenal cancers; both of which are very rare consisting of less than 2,400 incidences of new cases in the United States in 2011 (American Cancer Society, 2011).

Role of molecular imaging
Molecular imaging technologies used for thyroid cancer consist of radioactive iodine uptake imaging, radioactive iodine (I-131) therapy and positron emission tomography (PET) scanning. I-123-meta-iodobenzylguanidine (MIBG) scintigraphy is used on a limited basis to image and treat medullary thyroid cancer. Due to improved survival rates of patients with thyroid cancers, radioactive I-131 has now become a standard in treatment (Discovermi.org - SNM, 2011).

Other technologies include computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound. For parathyroid and adrenal cancers, the tumor is usually removed surgically and followed up with a molecular imaging scan. For parathyroid tumors, the patient is followed up with an ultrasound of the neck or a PET imaging scan (Parathyroid Glands). For adrenal cancers, the patient can be monitored with an MRI or CT (Adrenal Cortical Cancer Overview).

<table>
<thead>
<tr>
<th>Radiopharmaceutical</th>
<th>Manufacturer</th>
<th>Trade names</th>
<th>Approved indications in adults (pediatric use as noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indium-111 pentetreotide</td>
<td>Covidien</td>
<td>Octreoscan™</td>
<td>An agent for the scintigraphic localization of primary and metastatic neuroendocrine tumors bearing somatostatin receptors</td>
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</tbody>
</table>
| Iodine I-131 sodium iodide | Covidien | HICON™ | Diagnostic:  
• Localizing metastases associated with thyroid malignancies  
Therapeutic:  
• Treatment of carcinoma of the thyroid |
| Fluorine-18 fluorodeoxyglucose | Various | | As a PET imaging agent to:  
• Assess abnormal glucose metabolism |
| Iodine I-123 iobenguane | GE Healthcare | AdreView™ | In patients > 1 month of age as an adjunct to other diagnostic tests, detection of primary or metastatic:  
• Pheochromocytoma  
• Neuroblastoma |

MSDS and package insert information

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