

# Where all can ectopic brain be found

## Abstract

Aberrant location of brain tissue has been reported in a variety of locations in the body. While these are predominantly located in the upper half of the body, they have also been reported in the abdomen. Reported is the presence of mature brain tissue forming the predominant component of a benign retroperitoneal teratoma located in the region of the right adrenal. Benign teratomas contain glial tissue, but the presence of mature brain tissue in a benign teratoma has not been reported in the literature.

**Keywords:** mature brain tissue, benign retroperitoneal teratoma

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**Rakesh Handa**

Department of Pediatric Surgery, Army Hospital (Research and Referral), India

**Correspondence:** Rakesh Handa, MBBS, MS, MCh, DNB, FAIS, FIAPS, Senior Consultant Pediatric Surgery, Army Hospital (Research and Referral), New Delhi-110010, India, Tel +919810125022; Email drakeshanda@gmail.com

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## Introduction

Aberrant body tissues situated at abnormal/ectopic locations are a fairly common occurrence and occur at the developmental stage. Ectopic brain tissue has been reported within a variety of body tissues and locations. The scalp,<sup>1</sup> orbit,<sup>2</sup> ear,<sup>3</sup> the nasopharynx,<sup>4</sup> the oropharynx,<sup>5</sup> the parapharyngeal space,<sup>6</sup> the palate<sup>7</sup> and the tongue<sup>8</sup> are the more common of the ectopic locations where brain tissue has been reported. Ectopic brain tissue has also been reported from a mass simulating a tonsil,<sup>9</sup> from the lip,<sup>10</sup> within neck masses,<sup>11</sup> in a choristoma on the back,<sup>12</sup> within the eighth cranial nerve<sup>13</sup> and in the pterygo-palatine fossa.<sup>14</sup> It has also been known to be ectopically located in the subpleural space<sup>15</sup> or within the lungs and thereby presenting as respiratory distress.<sup>16</sup>

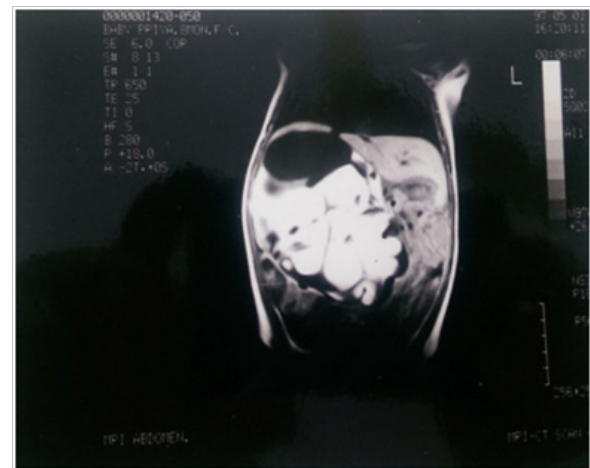
Presented is a case with ectopic mature brain tissue within a benign retroperitoneal teratoma located in the region of the adrenal gland.

## Case report

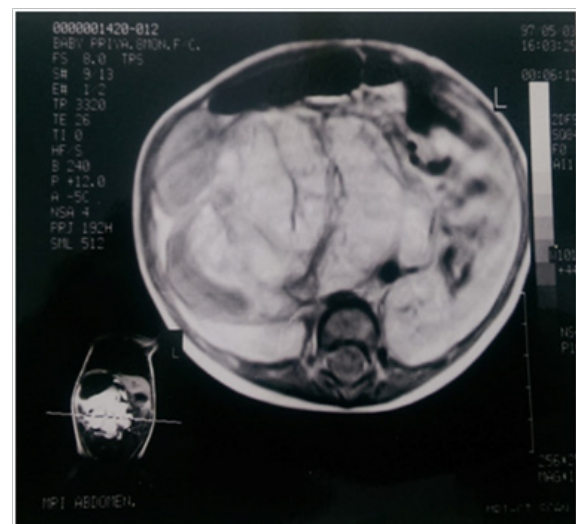
An eight month old male infant weighing 7 kgs was brought with a history of a progressively increasing lump in the right flank of two months duration. There was no associated fever, urinary symptoms or alteration of bowel habits. The child was a full term normal vaginal delivery and developmental milestones were essentially normal. Examination of the abdomen revealed a soft tissue mass approximately 8 x 10 cms in the right hypochondrium causing bulging of the right flank. The mass was ballotable and non-tender and the clinical diagnosis was of a large hydronephrosis. Ultrasound revealed the mass to be a multiseptate, predominantly cystic mass displacing the right kidney posteriorly and inferiorly and was opined to be a cystic neuroblastoma. An IVU confirmed the mass to be superior to the right kidney which was displaced downwards. MRI showed a soft tissue, partially cystic, retroperitoneal mass displacing the liver anteriorly and the kidney downwards (Figure 1) (Figure 2). The right adrenal was not separately identifiable. The mass was filling up the right side of the abdomen and was compressing the IVC in the entire length. Fine needle aspiration cytology from the mass resulted in the aspiration of clear fluid and cytology revealed round cells.

The child was subjected to an exploratory laparotomy and the entire mass, 8 x 7 x 5 cms in size and weighing 486 gms was completely excised. The post operative period was uneventful. Histopathological examination revealed the mass to be a benign retroperitoneal teratoma predominantly containing mature, well differentiated brain tissue in addition to adipose tissue, muscle, gastro-intestinal tissue and

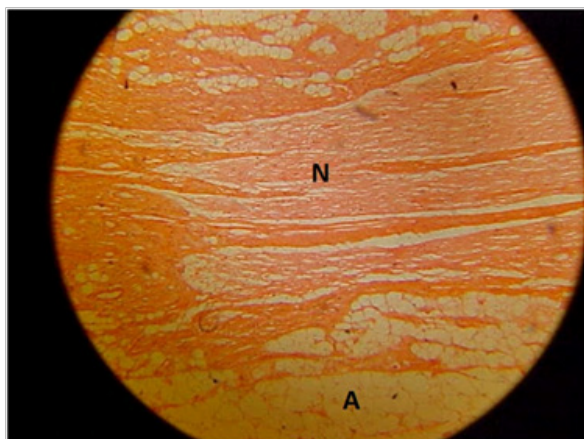
stratified squamous epithelium (Figure 3). No immature neural tissue was seen. The interesting thing about this case is that, in retrospect, the mass seen on the MRI looks very similar to a brain (Figure 1). The child has been under follow up for eight years and is doing well.



**Figure 1** MRI of the abdomen showing the mass having the gross appearance of a brain.



**Figure 2** Axial section on the MRI Abdomen showing a soft tissue mass.



**Figure 3** Microphotograph showing mature brain tissue (N) amidst adipose tissue (A).

## Discussion

Retroperitoneal teratomas contain tissue elements belonging to all the three layers - ectoderm, mesoderm and endoderm. Nerve tissue is a common constituent of benign teratomas. However the nervous tissue is mainly glial tissue only. Well differentiated, mature brain tissue as a component of a benign teratoma has not been reported in the literature so far. Review of literature shows ectopic brain tissue has been reported in a variety of locations, but all are mainly in the upper part of the body. Ectopic brain may be found in an intracranial position<sup>17</sup> or within the spine<sup>18</sup> also. This case had mature brain tissue as the predominant tissue of a benign retroperitoneal teratoma which was located in the region of the right adrenal gland. Ectopic brain tissue has been reported in the retroperitoneum also<sup>19</sup> but it was not within a retroperitoneal teratoma. Teratomatous tumours are interesting because of their bizarre origin, bizarre microscopic appearance and sometimes their unpredictable behaviour. Carney<sup>20</sup> has reported a series of 58 cases of teratomas in children, but all of them contained only glial tissue. No case had mature brain tissue in the retroperitoneal teratoma as is being reported.

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## Conflicts of interest

The authors declare there is no conflict of interests.

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