# Childhood retroperitoneal teratomas: 5 years of experience in a tertiary-care hospital

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***Background*** **Retroperitoneal teratomas are rare paediatric neoplasms. One should be well versed with the presenting features, relationship with surrounding vital organs and the extent of tumour before operating.**

***Aim*** **The present study was planned to highlight the presenting symptoms, preoperative investigatory findings, intraoperative findings, follow-up protocol and the surgeons' experience in handling these huge tumours.**

***Setting and design*** **This was a retrospective, tertiary-care hospital-based study.**

***Patients and methods*** **Patients with retroperitoneal teratomas operated between 2010 and 2015 were studied in detail. All the data were collected from case files.**

***Results*** **During the mentioned period, there were seven patients including four males and three females. There was no side predilection (three right, two midline, one left and one lesser omentum). All the tumours were completely excised, and histopathology confirmed the benign nature in all cases. All patients were followed-up with postoperative ultrasound and were found to be normal.**

***Conclusion*** **Retroperitoneal teratomas are benign tumours, and complete excision is curative.** ***Ann Pediatr Surg*** **12:158–161 © 2016 Annals of Pediatric Surgery.**

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## Introduction

Retroperitoneal teratomas are uncommon tumours of childhood, constituting about 5% of teratomas occurring in children [1]. They are the third most common retroperitoneal tumours in the paediatric age group after neuroblastoma and Wilms' tumour [2].

Most of them present with abdominal distension or lump abdomen, and complete surgical excision is the procedure of choice. However, because of close proximity to visceral organs and their huge size, they pose a challenge to the operating surgeon but are amenable to complete excision.

In this study, we report the spectrum of presentation, diagnosis and treatment of seven cases of retroperitoneal teratomas presenting to a tertiary-care hospital in last 5 years.

## Patients and methods

This was a retrospective study that included cases of retroperitoneal teratomas admitted to the department of paediatric surgery from 2010 to 2015. The records of all patients were archived from the case files. A detailed review regarding age at presentation, sex, chief complaints, site, diagnostic modalities, treatment and follow-up was performed.

## Results

Over a period of 5 years, a total of seven patients with retroperitoneal teratomas were operated and finally diagnosed as teratoma histopathologically. These included four males and three females. The age ranged from 2 days to 3 years (Table 1). In all the seven patients, the mode of presentation was abdominal distention with palpable abdominal mass. In spite of large intra-abdominal masses, the general conditions of children were good. Preoperative imaging investigations included radiograph, ultrasonography (USG) and computed tomography (CT) to delineate the nature of the tumour, extent of involvement and relation to surrounding organs (Fig. 1).

The routine blood investigations and biochemical parameters of all patients were within normal limits. Preoperative serum α-fetoprotein levels were determined in six patients, which were within normal limits. However, in one patient, who was operated on emergency basis because of intestinal obstruction, the test was not performed. In all of the cases, complete surgical excision through a transperitoneal approach was planned. There was no side preponderance (three on right side, two midline, one left side and one lesser omentum). The tumours were closely approximated to the kidneys, pancreas and vascular structures such as renal vessels, aorta, portal vein and inferior vena cava. In all the cases, the tumour was fully encapsulated and excised completely without any damage to the surrounding organs. Because of the cystic nature of

**Table 1 Complete details of patients presenting with retroperitoneal teratomas**

| Serial nos. | Age | Sex | Size (cm) | Site | Nature | Treatment | Outcome |
|---|---|---|---|---|---|---|---|
| Case 1 | 2 days | M | 12 × 10 | Midline | Benign | Excision | Cured |
| Case 2 | 9 month | F | 18 × 15 | Right | Benign | Excision | Cured |
| Case 3 | 1.5 years | F | 13 × 8 | Midline | Benign | Excision | Cured |
| Case 4 | 1.5 years | M | 12 × 10 | Lesser omentum | Benign | Excision | Cured |
| Case 5 | 2 years | M | 15 × 12 | Left | Benign | Excision | Cured |
| Case 6 | 3 years | M | 11 × 10 | Right | Benign | Excision | Cured |
| Case 7 | 3 years | F | 12 × 8 | Right | Benign | Excision | Cured |

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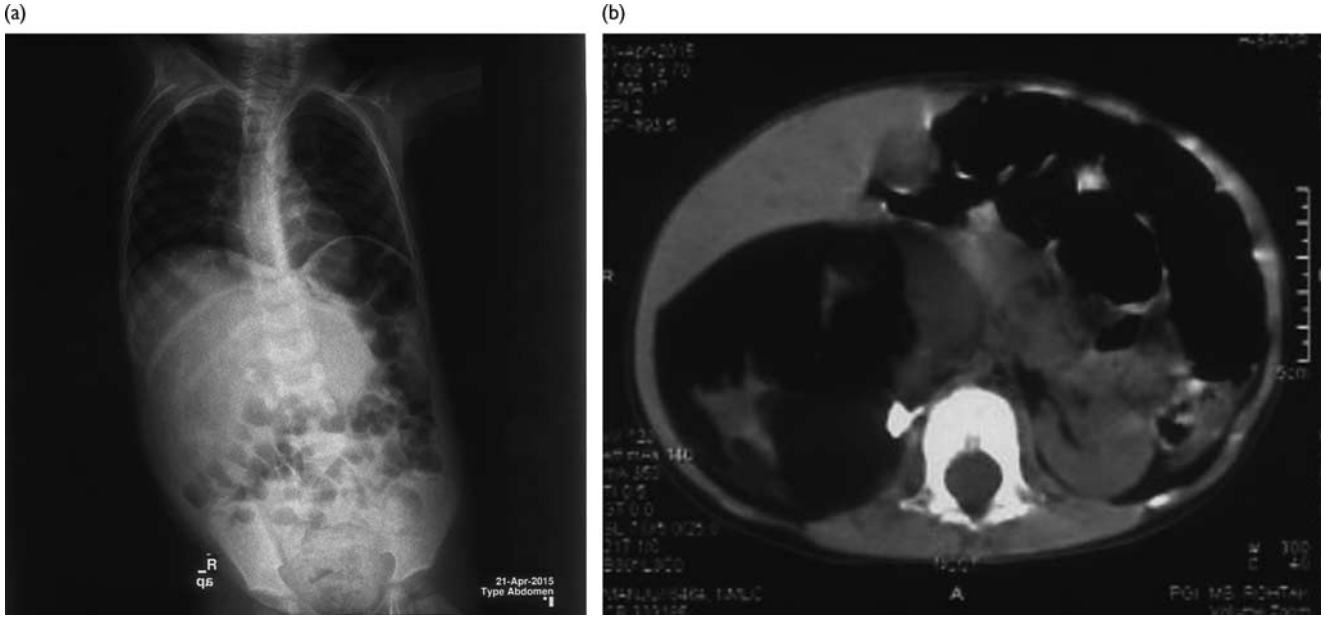
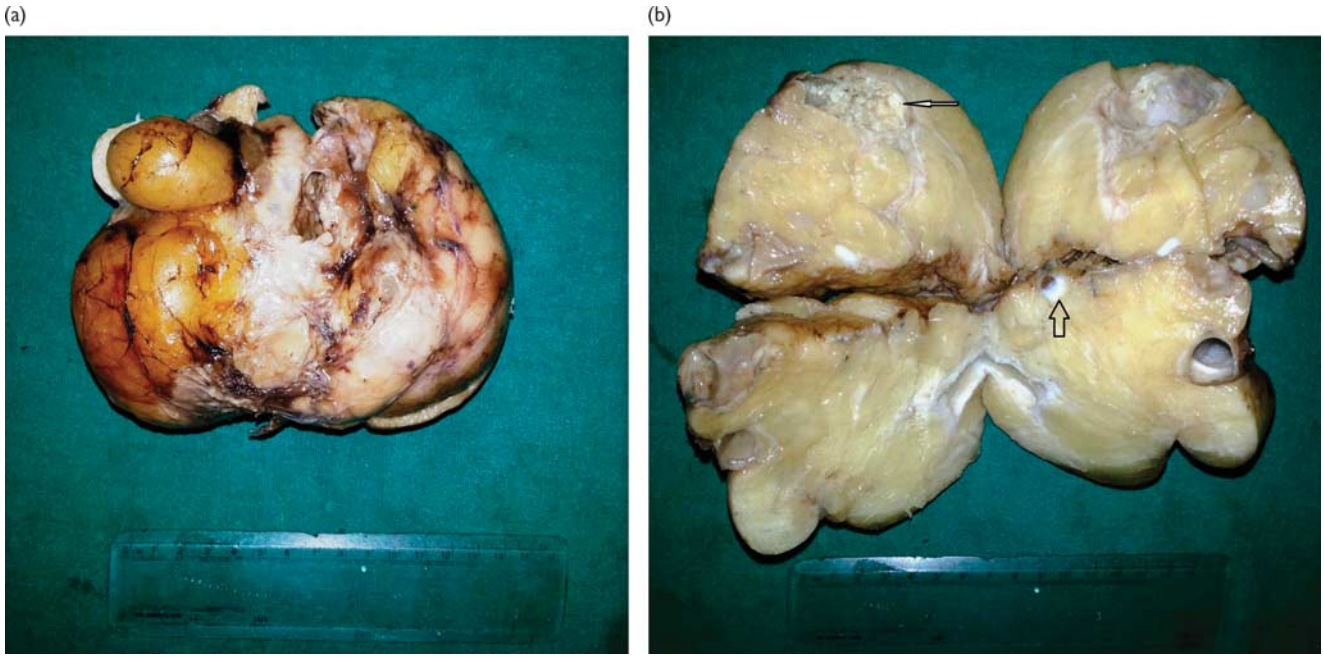
**Fig. 1**




Radiological imaging showing a right-sided retroperitoneal teratoma with calcification: (a) radiograph, (b) computed tomography scan.

**Fig. 2**



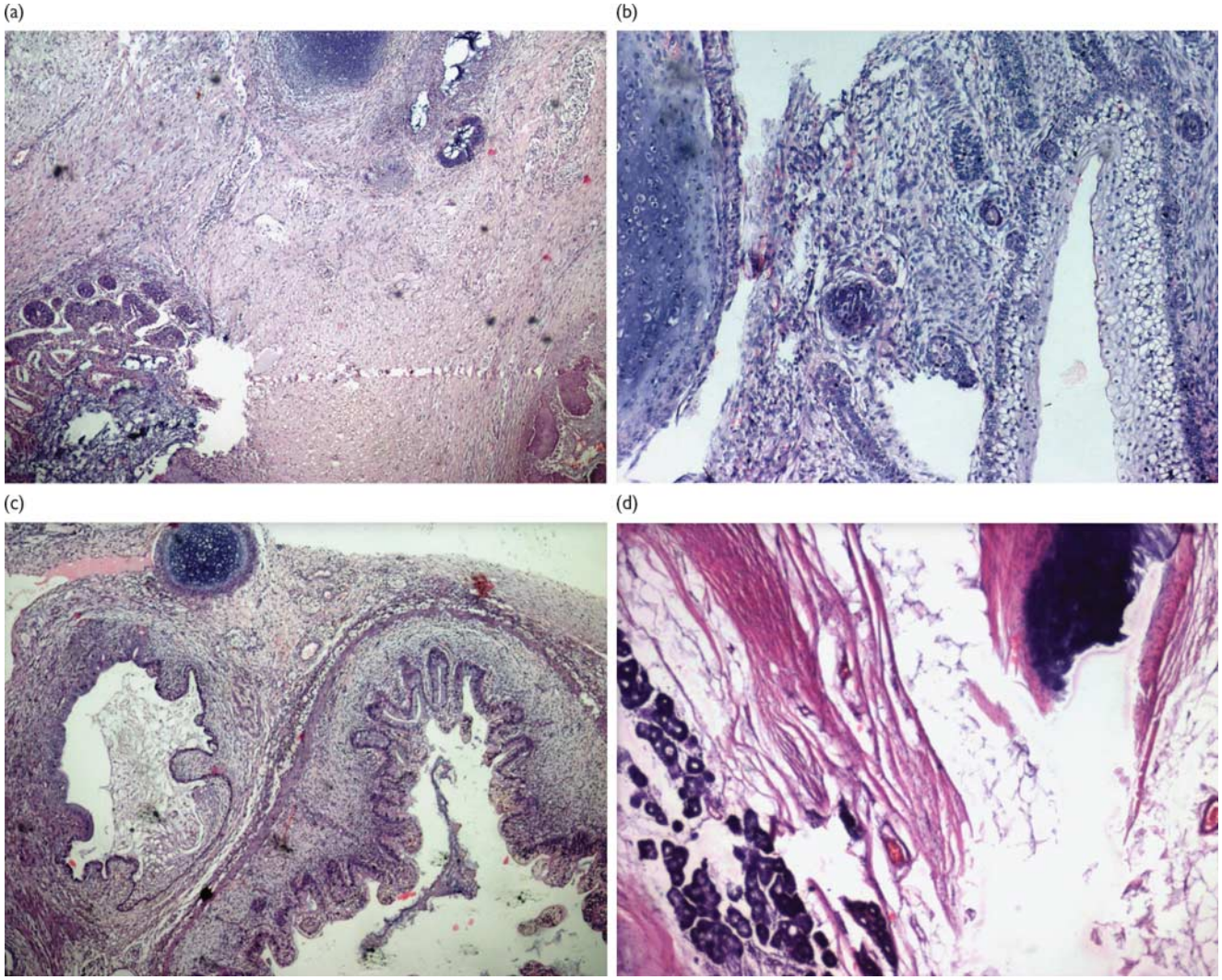

(a) Gross photomicrograph showing a large lobulated mass. (b) Cut section revealing hair-filled cyst (thin arrow) and cartilage (thick arrow).

the tumour, one patient was misdiagnosed USG as pelvico-ureteric junction obstruction, which turned out to be teratoma during the intraoperative examination, and was finally confirmed on histopathology. On gross examination, they were lobulated masses, and on serial sectioning revealed presence of hair, teeth, bone and small cysts filled with clear to mucinous material (Fig. 2). Microscopy showed mature teratoma in all seven cases (Fig. 3). The postoperative period was uneventful and all the patients were followed-up. The follow-up plan included abdominal USG at the third month after surgery and was found to be normal in all cases. The patients are followed-up every 6 months, and USG is performed to determine their status.

## Discussion

Teratoma contains the derivatives of all the three germ layers [3]. They can present at multiple sites, but in the

**Fig. 3**




Hematoxylin and eosin-stained sections showing cartilage along with skin, intestinal glands, respiratory lining epithelium, adipose tissue and bony tissue (a, c, d, ×40; b, ×100).

retroperitoneum they constitute 1–11% of primary retroperitoneal tumours [4]. Considering the age of presentation, neonatal teratomas have a higher incidence of malignancy than those in older children [5]. One of our cases presented during the neonatal period, but the tumour was benign on final diagnosis. In the present study, the youngest child was 2 days old, whereas the eldest child was aged 3 years. All the tumours were benign without any side (three right, one left, two midline and one lesser omentum) or sex preponderance, which is in agreement with the study by Grosfeld *et al.* [1]. The mode of presentation was abdominal distension and a palpable mass.

As a part of routine protocol, USG was the first imaging modality used followed by abdominal radiography, which revealed the presence of calcification or bony tissue. However, USG sometimes has its own limitations, such as in one of our cases misdiagnosed as pelvico-ureteric junction obstruction. Schey *et al.* [6] are in favour of only a plain abdominal radiograph and excision of the tumour if the characteristic calcification is demonstrated. Presence of bones or teeth on radiograph was also considered most helpful for the diagnosis of teratomas by Lack *et al.* [7]. CT scan is used to delineate the extent of tumour and surrounding vascular structures, but sometimes can help in diagnosis as in our misdiagnosed case. However, CT scan findings can sometimes be misleading, as the extent of tumour seen by CT scan in such cases is more than that at the time of exploration. CT findings regarding size of tumor should not prevent us from exploration as large or even bilateral tumors were completely excised in our study. Among serological parameters, serum alpha feto protein (AFP) levels are important in assessing the recurrence or malignant nature of the tumour. At our centre, the follow-up protocol included USG at the third postoperative month, which if abnormal will be further followed-up by serum AFP level tests. In all of our patients, the third-month USGs were normal. Benign retroperitoneal teratomas can be cured by complete surgical excision [8]. As malignancy is uncommon in retroperitoneal teratomas and as they can be excised completely, complete excision should be attempted even in lesions involving both sides of the abdomen [9].

Prognosis is generally excellent and curative as most are benign and completely excisable. Tapper and Lack [10] reported that the single most important factor in prognosis is complete removal of the tumour.

For malignant and immature teratomas, excision with postoperative chemotherapy and follow-up with serum AFP levels are advised.

## Conclusion

Retro-peritoneal teratomas are uncommon paediatric tumours that are mostly benign. Although they look horrifying during surgery, complete excision is possible without causing any damage to surrounding vital organs because they are well encapsulated and require expertise and patience.

## Acknowledgements

### Conflicts of interest

There are no conflicts of interest.

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