

reduction deformities, unilateral bone hyperplasias and digital lengthening have also been described(1,2,4,5). In the present case, the unusual feature found is lengthening of femur, tibia and fibula on right side. Right lower limb was 7 cm longer than the left side. Skeletal changes in this condition are secondary to external pressure and erosion, stimulation or inhibition of epiphyseal longitudinal growth. The incidence of skeletal involvement is reported from 30 to 50%(5).

This child had more than 5 cafe-au-lait spots which suggested the diagnosis of neurofibromatosis. One lisch nodule was seen in the present case. The nodules are pigmented hamartomas of the iris. They are seen in about 25% of children younger than 6 years. They increase with age, and are seen in nearly 94% of adults(2). Though these lesions are not related to severity, they help in establishing the diagnosis(6).

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#### REFERENCES

1. Listernick R, Charrow J. Neurofibromatosis type-1 in childhood. *J Pdiatr* 1990, 116: 845-853.
2. Riccardi VM. Von Recklinghausen neurofibromatosis. *N Engl J Med* 1981, 305: 1617-1626.
3. Carter M, Keefe EJO. Hereditary cutaneous disorders. *In: Text Book of Dermatology*, 2nd edn. Eds. Moschella SL, Hurley HJ. Philadelphia, WB Saunders Co, 1985, pp 1192-1198.
4. Tunnessen WE. Extremities—Asymmetry. *In: Signs and Symptoms in Pediatrics*, 2nd edn. Ed Tunnessen WE. Philadelphia, J.B. Lippincott Co, 1985, pp 509-512.
5. Turlek SL. Fibrous diseases. *In: Principles and Their Application in Orthopedics*, 4th edn. Ed Turek SL. Philadelphia, J.B. Lippincott Co, 1989, pp 725-728.
6. Charles SJ, Moore AT, Yates JRW, Ferguson MA, Smith. Lisch nodules in neurofibromatosis in type 2. *Arch Ophthalmol* 1989, 107: 1571-1572.

## Immature Gastric Teratoma in a Neonate

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Gastric teratoma, a very rare tumor of infancy is essentially benign. Immature (embryonic) elements have been described

in only two of the sixty-six cases described previously. This report concerns with the third 'immature' gastric teratoma described in literature, which incidentally is also the largest tumor ever removed in a neonate.

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**Case Report**

A 15-day-old male neonate weighing 2800 g was admitted with abdominal distension and respiratory distress since birth. He was born prematurely at 34 weeks of gestation by normal vaginal delivery. Examination revealed a firm, multicystic mass occupying the whole of the abdomen. Plain X-ray of the abdomen showed a soft tissue shadow, but no areas of calcification were seen. Ultrasound revealed it to be a multicystic mass lying anterior to the normal kidneys; although the exact origin of mass or the organs involved could not be ascertained.

The child was taken up for surgery the next day. Exploratory laparotomy revealed a massive multicystic mass arising from the posterior gastric wall close to the greater curvature. A part of the tumor, predominantly solid, was extending into the filling most of the lumen of the stomach. The mass was excised *in toto* along with a small fringe of the gastric wall from which the lesion originated. The stomach was repaired in two layers. During surgery, the child was administered intravenous cefatoxime and the same antibiotic was continued post-operatively.

The excised specimen measured 14 X 9 X 6 cm and weighed 1150 g (Fig. 1). Cut surface revealed that the "exogastric" portion of the tumor was composed of large cystic areas, whereas the "endogastric" portion was mainly solid. The solid tissue was composed of greyish white areas interspersed with foci of cartilage and bone. Microscopically, the tumor was composed of a mixture of mature tissues derived from all three germinal layers. A few areas of immature neuroepithelial elements were also seen (Fig. 2). Biopsy was reported as immature gastric teratoma.

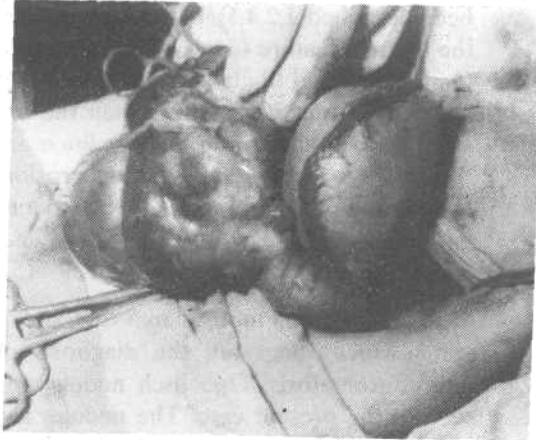


Fig. 1. Tumor arising from the posterior wall of the stomach. Note that the exogastric portion of the tumor is predominantly cystic.

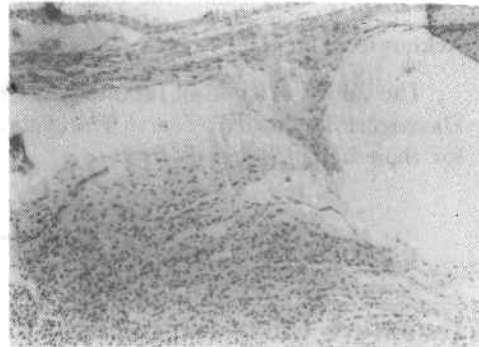


Fig. 2. Microphotograph of the tumor showing immature neuroepithelial elements (hematoxylin-eosin x 100).

The child developed sclerema and succumbed to septicemia on the fifth post-operative day.

**Discussion**

Gastric teratomas are exceedingly rare lesions accounting for less than 1% of all teratomas in childhood(1). Only 66 cases

TABLE I—Reported Immature Gastric Teratomas

Study	Sex	Age at presentation	Duration of history	Localization	Treatment	Result
Berry <i>et al.</i> London (1969)	M	2 days	Since birth	Not mentioned	Incomplete excision	Alive and well after 4 years
Ravikumar <i>et al.</i> Coimbatore (1986)	M	40 days	20 days	Posterior wall	Complete excision	Not known
Sharma <i>et al.</i> Jaipur (1992)	M	15 days	Since birth	Posterior wall	Complete excision	Died in immediate post-op. period

have been reported so far(2). Majority of the cases have been reported under 1 year of age and unlike other teratomas, there is a preponderance of males with this neoplasm(3). The typical teratoma is a benign tumor, predominantly exogastric, having both solid and cystic areas(3). Most infants are asymptomatic except for abdominal distension secondary to the left upper quadrant mass. Upper gastrointestinal bleeding has also been reported in a few cases(2,4).

The tumor reported here had two distinctive features that are not frequently seen. This is one of the largest gastric tumor ever removed in a neonate; gastric teratoma weighing more than 1000 g has been reported only once before(5). Such large tumors have been known to cause premature labor, dystocia and respiratory distress in the newborn(6). Spontaneous rupture of such a large gastric teratoma has been reported once(5).

The more important feature worth highlighting is the presence of immature tissues in the teratoma. The striking coincidence between the present case and the two previously reported immature gastric terato-

mas is that immature foci were seen in only the neural component of the tumors(7,8). All of these tumors have been reported in neonates (Table I). Malignant gastric teratoma has never been reported in the literature.

Surgical extirpation is all that is required. Results have been uniformly good; only six out of the sixty six patients reported previously died(2,9). Recurrence or malignant degeneration has never been reported. But the immature teratomas at other sites have been known to recur as malignant lesions(10) and hence we feel that a close follow up is mandatory whenever 'immature' teratomatous elements are seen in a gastric teratoma.

#### REFERENCES

1. Grosfeld JL, Ballantine TV, Lowe D, Baeleur RL. Benign and malignant teratomas in children. *Analysis of 85 patients.* *Surgery* 1976, 80: 297-307.
2. Gangopadhyay AN, Pandit SK, Gopal CS. Gastric teratoma revealed by gastrointestinal hemorrhage. *Indian Pediatr* 1992, 29: 1145-1147.
3. Snenocak ME, Kale G, Buyukpamukcu

PEDIATRIC SURGERY

- N, *et al.* Gastric teratoma in children including the third reported female case. *J Pediatr Surg* 1990, 25: 681-684.
4. Cairo MS, Grosfeld JL, Weetman RM. Unusual cause for bleeding of the upper gastrointestinal tract in the newborn. *Pediatrics* 1981, 67: 721-724.
  5. Bakunai S, Ochida H. A case report of large gastric teratoma with perforation. *Tokyo Med* 1960, 77: 373-374.
  6. Matias IC, Huang YC. Gastric teratoma in infancy. *Ann Surg* 1973, 178: 631-636.
  7. Berry CL, Keeling J, Hilton C. Teratoma in infancy and childhood: A review of 91 cases. *J Path* 1969, 98: 241-252.
  8. Ravikumar VR, Ragupathy R, Das L, *et al.* Gastric teratoma in an infant. *J Pediatr Surg* 1986, 21: 948.
  9. Basak D, Das A, Chatterjee SK, Mukherjee P. *Indian Pediatr* 1991, 29: 231-234.
  10. Schropp KP, Lobe ET, Rao B, *et al.* Sacrococcygeal teratoma: The experience of four decades. *J Pediatr Surg* 1992, 27: 1075-1079.
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