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ORIGINAL ARTICLE

Gastric teratoma in children: Our experience

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Summary *Background/Introduction:* Gastric teratoma is an extremely rare tumor, almost exclusively benign, accounting for < 1% of all teratomas in infants and children.
Purpose/Aim: This work aimed to study the clinical presentation, investigation modalities, intraoperative findings, histopathological types, and surgical outcome of gastric teratoma in children.
Methods: A retrospective study was performed from 1993 to 2013 in two pediatric institutes.
Results: There were eight patients with gastric teratoma and all of them were male. Seven (87.5%) patients presented in infancy, out of which four (50%) patients were neonates, while one (12.5%) patient was a toddler. The manifestations were as follows: a palpable abdominal mass in seven (87.5%), abdominal distension in five (67.5%), anemia in four (50%), respiratory distress in three (37.5%), gastric outlet obstruction with recurrent vomiting in three (37.5%), and abdominal pain, anorexia, and melena in one (12.5%) each. Ultrasonography showed a solid cystic mass with mixed echogenicity in all the patients, while calcification was seen in seven (87.5%) cases. Computed tomography, which was performed in four (50%) patients, clinched the preoperative diagnosis. A growth was present on the posteroinferior wall near the greater curvature in seven (87.5%) cases, while in one (12.5%) patient, it was arising from the lesser curvature. Excision of the tumor was performed in all patients. Histopathology was mature type in six (75%) cases, and immature Grade 1 and 2 in one (12.5%) each. Complications were seen in five (62.5%) cases, and one (12.5%) mortality was observed in our series. All other patients were doing well in the postoperative period.

Conflicts of interest: The authors declare no conflicts of interest regarding the publication of this paper.

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Conclusion: Gastric teratoma is almost always benign and has predilection for male sex. It commonly presents as a palpable abdominal mass. Complete surgical excision is curative. Close observation is recommended for Grade 2 and 3 immature teratomas. The prognosis is excellent.

1. Introduction

Gastric teratoma is an extremely rare tumor, almost exclusively benign, accounting for <1% of all teratomas in infants and children.[1,2] These tumors usually occur in infants (94%), especially in the neonatal period.[3,4] However, there have been reports of this tumor occurring in older children.[5] Approximately 120 cases have been reported in the English literature to date.[5–8]

Gastric teratomas form a distinct subset of teratomas as follows: (1) unusual male predominance (> 95%), compared to female preponderance (65–70%) at other sites (e.g., sacrococcygeal teratoma)[2,9]; (2) not associated with any congenital anomalies in contrast to 10–15% incidence at other sites[7]; (3) not associated with any syndrome, except for a solitary case report of gastric teratoma with the Beckwith–Wiedemann syndrome and peritoneal gliomatosis[10]; (4) not associated with the dorsal body axis and embryonic body wall[11]; and (5) almost always benign in nature (with the exception of 3 cases reported in the literature), as compared to 10–39% incidence of malignancy at other sites such as the sacrococcygeal region, mediastinum, and gonads.[12–14] Owing to the extreme rarity and unique characteristics of this entity, we present, herein, a series of gastric teratomas presented to our institutes and share our experience along with a review of literature.

We aimed to study the clinical presentation, investigation modalities, intraoperative findings, histopathological types, and surgical outcome of gastric teratomas in children.

2. Methods

We present a retrospective study of pediatric patients with gastric teratomas. All clinical, operative, and postoperative records of patients admitted to two pediatric institutes over a period of 21 years from 1993 to 2013 were reviewed.

The inclusion criterion was children diagnosed with gastric teratoma.

Charts were reviewed according to age, sex, chief complaints, associated signs and symptoms, associated anomalies, preoperative diagnosis/method of diagnosis, location of tumor, type of growth (endogastric/exogastric), surgical procedure, histopathology report, and postoperative complications, including recurrence if any. All possible radiologic investigations, including abdominal radiographs, ultrasonography, and computed tomography (CT) scans were carefully reviewed in order to identify calcification and growth characteristics. The patients were followed up for 5 years, while the last patient is being under supervision for 2 years.

3. Results

The results of the study are shown in Table 1. There were eight patients with gastric teratomas and all of them were male. Their ages ranged from 1 day to 3.5 years. Seven (87.5%) patients presented in infancy, out of which four (50%) were neonates, while one (12.5%) was a toddler. The manifestations were as follows: a palpable abdominal mass in seven (87.5%), abdominal distension in five (67.5%), anemia in four (50%), respiratory distress in three (37.5%), gastric outlet obstruction with recurrent vomiting in three (37.5%), and abdominal pain, anorexia, and melena in one (12.5%) each. Ultrasonography showed a solid cystic with mixed echogenicity mass in all the patients, while calcification was seen in seven (87.5%) cases. CT, which was performed in four (50%) patients, provided classical findings of teratomas, seen as the presence of a well-encapsulated, multiseptate, enhancing, solid cystic mass with areas of calcification (Figure 1) and clinched the preoperative diagnosis.

Operative intervention was carried out in all the patients. A growth was present on the posteroinferior wall near the greater curvature in seven (87.5%) cases (Figures 2–4), while in one (12.5%) patient, a growth was arising from the lesser curvature. Tumor was purely exogastric in six (75%) cases, while it was predominantly exogastric with minimal endogastric component in two (25%) patients. Excision of the tumor along with a small fringe of the gastric wall and primary gastric closure was performed in all patients. Histopathology was mature type in six (75%) cases, and immature Grades 1 and 2 in one (12.5%) each. Complications were seen in five (62.5%) cases, and there was one (12.5%) mortality in our series. All other patients were doing well in the postoperative period. Recurrence was not seen in any of our cases.

4. Discussion

The word teratoma is derived from the Greek word "teraton," meaning "monster." Teratomas are relatively common embryonic neoplasms arising from totipotent cells and contain elements from all the three germ layers. In infancy and early childhood, the most common site of teratomas is the extragonadal region, which includes sacrococcygeal, mediastinal, presacral and rarely intracranial, retroperitoneal, and cervical regions, whereas after childhood, they are more usually located in the gonads.[1]

Gastric teratomas, a unique subgroup of teratomas, present especially in neonates and infants. It was first reported in 1922 by Eustermann and Sentry.[4] The exact cause of gastric teratomas is not known, and, similar to other