CORRESPONDENCE

To the Editor:

In the case report of gastric teratoma in a female infant by Gengler et al, it was mentioned that there had been no report of malignant gastric teratoma.[1] In fact, Ravikumar and Ragupathy reported a case of gastric teratoma, probably malignant, that had immature neural elements.[2] We reported a gastric teratoma that showed all the histopathologic criteria of malignancy. The case had been treated by simple resection, and the patient was free of complications and recurrence 12 years later.

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THE PHYSICAL BASIS OF SEVERITY OF TORSO INJURY OWING TO FALLS IN CHILDHOOD

To the Editor:

A well known observation to every pediatric and trauma surgeon is that children are injured less severely than adults by a similar impact affecting them. It can be demonstrated best by looking into the mechanics of fall from height.

The velocity (V_t) of any object falling freely from height (h) in vaccum is independent of its mass (m) and is derived by the formula

$$V_t = \sqrt{2gh}.$$

However, fall on earth is associated with reduction in velocity owing to friction of the body in the atmosphere. The reduced velocity is proportional to the size and shape of the body. The younger the child, the greater is the ratio of body surface area to mass, and therefore his/her velocity is reduced more because of the friction.

The damage caused to the body by the impulse of any fall is derived from the formula:

$$\int_0^t Fdt = mV_t,$$

where Fdt = impulse, mv = momentum, m = mass, and V_t = end velocity.

Because F (force of injury) is affecting the body through the surface area at the time of collision, and because of the relatively larger body surface area of the infant, any mass unit is affected by a relatively smaller force.

Furthermore, the damaging effect of the impulse on the tissue is inversely related to the elasticity and compliance of the tissue. The connective tissue in the pediatric age group is composed of type III collagen, and therefore is more elastic and more resilient to any impulse.[1]

These considerations may explain why there is relatively less damage to visceral parenchymatous organs caused by trauma in children and infants when compared with adults. However, because an infant's head is relatively large in size and mass in comparison to the whole body mass, during a fall infants tend to be directed head-down and therefore the head absorbs most of the impulse, resulting in severe cranial injury.[2]

A detailed look into the physical mechanics of trauma may solve the apparent inconsistencies between the expected and observed severity of injury among the pediatric age group.

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