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Case Report

Mature cystic teratoma of gall bladder – Where do they come from?

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of lesser omentum with involvement of the gall bladder, immature teratoma of the gall bladder associated with gliomatosis peritonei and immature embryoid teratoma of gall bladder have been reported in clinical journals.^{1–4} We are reporting the first case of mature cystic teratoma of gall bladder in a 55-year-old female patient and discussing the possible pathogenesis behind its origin.

Case report

A 55-year-old female patient presented with history of abdominal pain and loose stools for last 1 year. CT scan showed a gall bladder mass lesion with benign fat density without pericholecystic and hepatic invasion, and no meta-static lymph node enlargement.

Surgery was performed and the gall bladder specimen was sent for histopathological examination. Grossly, the specimen of gall bladder measured $8 \times 3 \times 1 \text{ cm}^3$, with an uneven outer surface. The wall was thinned out and calcified at few places. On cut opening, yellowish brown cheesy appearing pultaceous material was noted. The inner mucosal rugosity of gall bladder wall was lost. Few papillary projections ($2.5 \times 0.5 \text{ cm}^2$) along with a tooth like structure was noted (Fig. 1a). Thorough sampling was done (40 blocks were prepared). Sections from the papillary area showed keratinized squamous epithelial lining, sebaceous glands, multiple hair follicles (Fig. 1b) along with focal area showing respiratory epithelial lining and adipose tissue. Other areas showed neural tissue (Fig. 1c),

Introduction

Teratomas are tumours composed of several types of tissues representing different germinal layers (endoderm, mesoderm and ectoderm). While teratomas are known to predominantly occur in the testis, they may occur in any midline structure like mediastinum, retroperitoneum, sacrococcygeal region, central nervous system, thyroid, sinonasal, kidney, uterine corpus, fallopian tube etc. Isolated cases of primary hepatic malignancy with reference to embryoma of infancy, teratoma

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Fig. 1 – a-Photomicrograph showing gross specimen of gall bladder with tooth like structure (black arrow) and papillary structure (red arrow). b-Photomicrograph shows keratinized squamous epithelial lining, sebaceous glands, multiple hair follicles (haematoxylin-eosin, original magnification $\times 100$). c-Photomicrograph shows neural tissue (yellow star), muscle tissue (red star) and spicules of calcification (green star) (haematoxylin-eosin, original magnification $\times 100$) (Picture in inset shows a higher magnification of neural tissue). d-Photomicrograph shows migration of primordial germ cells (indicated by arrows) from yolk sac to the hind gut to the genital ridge. Most of the PGCs remain in the yolk sac and becomes part of the wall of the midgut and hind gut⁶ (not shown in figure).

cartilage and normal layers of gall bladder with sections from thinned out wall showing spicules of calcification. From the gross and microscopic findings, a diagnosis of Mature Cystic Teratoma of gall bladder was made.

Discussion

The histogenesis of extragonadal teratomas is controversial. Cases of primary primitive neoplasms (immature embryomas, teratomas and neuroectodermal variants) arising in hepatic and peritoneal tissues besides gall bladder have been reported.^{1–4} This has led to the development of the following two hypotheses behind the origin of primitive neoplasms in the gall bladder.⁴

The first one being that, endothelium of adult gall bladder can dedifferentiate resulting in precursor, primitive or immature neoplastic lesions.⁴ But as reported in a case of gall bladder embryoma, which had mature as well as immature teratomatous and neuroectodermal components, the dedifferentiation of gall bladder endothelium can't explain both the presence of mature and immature components.⁴

So, a second hypothesis was proposed.

Human primordial germ cells (PGCs) first appear among the endoderm cells in the wall of the yolk sac close to the

allantois in 24 days post coitus (pc) old embryos and then migrate by amoeboid movement along the dorsal mesentery of the hindgut to the primitive gonads (arriving by beginning of 5th week pc) (Fig. 1d).⁵ But the majority of the PGCs remain in the proximal end of the yolk sac, which becomes part of the wall of the hind- and midgut close to the aorta as the lateral folding is completed in the beginning of the fifth week pc.⁶ Early in the 4th week of intrauterine life, a hepatic diverticulum appears in the ventral wall of the primitive midgut, which gives rise to liver, extrahepatic biliary ducts, gall-bladder, and ventral pancreas.⁷ So, the gall bladder most probably contains trophoblastic cell (i.e. PGCs) rests, which differentiates into polyclones giving rise to variants that are polyembryomatous, teratomatous (immature and mature), neuroectodermal, mesodermal, rhabdomyosarcomatous and carcinomatous (small and large blastic), and carcinoid tumours.⁴ The present case of mature cystic teratoma of gall bladder can be explained on the basis of this hypothesis. The absence of surrounding organ involvement, any metastatic lymph nodes in CT scan and absence of neoplastic tissue on histopathology rules out the possibility of a metastatic origin in the present case.

Generalizing the two hypothesis to explain the origin of extragonadal teratomas in various sites other than gall bladder, we find that teratomas arising in skin,⁸ proximal humerus⁹ (not

in the path of PGC migration and so doesn't contain tropho-embryoblastic cells) may be explained on basis of 1st hypothesis (by dedifferentiation of mature tissue). Pathogenesis of teratomas arising in the midline (mediastinum, retro-peritoneum, uterus) favours the 2nd hypothesis (of PGC migration). Though the present case can be explained on the basis of 2nd hypothesis, which of the two actually leads to gall bladder teratoma and if the differentiation and prognosis depends on the pathogenesis is a matter of debate and further research.

Conflicts of interest

All authors have none to declare.

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