
Imaging diagnosis

Case 346

5. Mature cystic teratoma with malignant transformation

[Progress]

She is scheduled to visit the local hospital where her ovarian cyst was first indicated with a letter of imaging diagnosis.

[Discussion]

There are my confusions about mature cystic teratoma, dermoid cyst, epidermoid cyst, and epidermal cyst because the differences between mature cystic teratoma and dermoid cyst are obscure for me. Further, the usage of epidermoid cyst and epidermal cyst is not always used distinctly in some English manuscript (1, 2). Then, the attempt of clarifying the differences and things in common among them is conducted by using this case report.

First, mature cystic teratoma, dermoid cyst, and epidermoid cyst are congenital or hamartoma, while epidermal cyst is acquired (3). In the development stage of fertilized egg, ectodermal, mesodermal, and endodermal stages are divided. Dermoid cyst, a hamartoma of dermis means a part of dermal component is included to different portion at the development stage and enlarges with its growth. Epidermal cyst is a hamartoma of epidermis, dermoid cyst, a hamartoma of epidermis and dermis, teratoma is a hamartoma of ectodermal, mesodermal and endodermal.

Second, a thing in common among dermoid cyst, epidermoid cyst, and epidermal cyst is that they contain keratin (3). Meanwhile, teratoma contain lipid, tooth and keratin. Keratin is a kind of protein that is much contained in epidermis and hair follicle and a major component protein of skin, hair, feather and vertebrae. Content of cystic fluid of epidermal cyst, epidermoid cyst, and dermoid cyst is keratin pool. CT values of keratin are around 1, implying almost the same value of water (1-3). It indicates that it is difficult to differentiate epidermoid cyst from arachnid cyst on brain CT. However, on MRI with Diffusion WI and ADC image can differentiate epidermoid cyst from arachnid cyst because keratin in epidermoid cyst repress diffusion of water molecules. It is reported that ADC values of epidermoid cyst are around 1.06, while those of epidermal cyst are 0.81 (3). This difference is probably because epidermal cyst arises from occlusion of hair pole, accumulating keratin causing inflammation with abscess formation. Further, pathology of epidermoid cyst and epidermal cyst reveals almost common histologic findings of squamous epithelium and keratin pool. The difference between them that epidermoid cyst contains almost one layer of non-keratinized squamous cells while epidermal cyst contains multilayered squamous layers, indicating dens keratin in epidermal cysts.

Mature cystic teratoma contain not only keratin but also lipid, indicating easy to identify on CT and MRI. In clinical reality, clinical problems on mature cystic teratoma are listed as follows: torsion, perforation causing chemical peritonitis and malignant transformation. Malignant transformation occurs in 3% or less (4-7). Squamous cell carcinoma is most followed by adenocarcinoma, melanoma or transitional cell carcinoma (4-7).

【Summary】

We presented a forty-one-year-old female for her anti-P53 antibody-antibody elevation to 1.5 U/ml. Her pelvic MRI depicted a mature cystic teratoma with solid component whose ADC values were 0.7 level, indicative of the lesion with repressive water molecule diffusion, suspicious of malignancy. It is borne in mind that dermoid cyst, epidermoid cyst, and epidermal cyst contain keratin pool in common. Dermoid cyst contains not only epithelial components of stratified squamous cell epithelium but also dermis components of hair, sweat glands. Epidermoid cyst contain non-keratinized squamous cell epithelium and keratin, while epidermal cyst contain keratinized stratified squamous cell epithelium and keratin. CT values of keratin is around 1.0 the same as water. MRI diffusion WI depict keratin as high signal intensity since keratin repress water molecules diffusion, indicative of MRI diffusion usefulness for diagnosis of presence of keratin. Mature cystic teratoma composed of ectodermal, mesodermal and endodermal components causes clinical problems such as torsion, perforation, and malignant transformation to squamous cell carcinoma followed by adenocarcinoma.

【References】

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