

Imaging diagnosis

Case 377

3. Epidermal cyst

【Progress】

Surgical resection was conducted and it revealed that the lesion was an epidermal cyst and rectal stenosis was caused by mural thickening.

【Discussion】

What is the fluids content among epidermal cyst, epidermoid cyst, dermoid cyst and cystic teratoma? This is the self-question and self-answer. Shifting the eyes to ovarian cystic lesion, it includes ovarian cyst: serous cyst, mucinous cyst, endometrial cyst, dermoid cyst and cystic teratoma. Serous cyst contains serous fluid, mucinous cyst contains mucin, endometrial cyst contains blood, dermoid cyst contains keratin and sebum (fatty acids, triglycerides) and cystic teratoma contains keratin, sebum, calcification and fatty tissue. The fluids components of cystic teratoma are sebum and keratin. The term of mature cystic teratoma is used in case of teratoma with fluids of keratin and sebum, and calcification, and without fatty tissue (1).

Some people say that epidermoid cyst and epidermal cyst are identical (2). It is true that histological findings between them are the same as that they are composed of epithelial tissue which are covered with stratified squamous cells and fluids with large volume of keratin and small volume of cholesterol (3, 4).

However, epidermoid cyst is used for congenital, while epidermal cyst is used for acquired: it is formed by occlusion of hair pole, inducing to accumulate of keratin. Both contain many keratins as fluid components.

Keratin, which is produced by squamous cells, is skin protein which functions to prevent water loss from skin surface. Keratin is known to be 53 kinds depending on differences of amino acids; largely to be classified into two; hard keratin, nail and hair: soft keratin, skin.

Both of epidermoid cyst and dermoid cyst emerge from ectoderm germ layer. Dermoid cysts include stratified squamous cells and skin appendages such as hair, sebaceous gland, sweat glands (4, 5). The fluid components are keratin, sebum and sweat. Sebum is composed of triglycerides, fatty acids and cholesterol (5). It is important to get acquired that dermoid cysts contain keratin and sebum as a form of emulsion but not contain fat tissue which indicates to belong to medium germ layer.

Meanwhile teratoma includes components of ectoderm, mesoderm and endoderm. Cystic teratomas are composed of fluids such as keratin, sebum, sweat, and of solids such as calcification, bone, tooth, thyroids, fat tissue. When fatty tissue is included in the tumor with keratin fluids, that is cystic teratoma but not dermoid tissue because sebum of fatty components exist in the condition of emulsion.

Keratin is a skin protein figuring cheese from a macroscopic view, while sebum includes fatty acids and triglycerides figuring fluids. ADC values of epidermal cyst or epidermoid cyst are lowering to 0.50 to 1.15 (mean 0.81), depending upon the concentration of keratin. ADC values of congenital epidermoid cyst are 1.06 to 1.15 while those of acquired epidermal cyst are 0.81(6). This is probably because acquired epidermal cyst contains pure keratin while epidermoid cyst contain not only keratin but also others such as cholesterol.

In our case, ADC values of epidermal cyst are 1.000 that are considered not contradictory to epidermoid cyst.

【Summary】

We presented a seventy-eight-year-old male with painful anus. A lesion with smooth surface below the tailbone was depicted low signal intensity on T1WI, relatively low signal intensity on T2WI, high signal intensity on fat suppression T2WI, high signal intensity on Diffusion WI and lowering on ADC map. ADC values are around 1.0. The fluids of the lesion are compatible with keratin, indicative of epidermoid cyst. It is borne in mind that fluids of epidermoid cyst and epidermal cyst include much keratin and a small cholesterol. The fluids of dermoid cyst and cystic teratoma contain much keratin as well, and plus sebum and sweat. Teratomas contain tooth, bone, thyroid glands and lipid tissue as solid components.

【References】

1. Smirniotopoulos JG, et al. Teratomas, dermoids, and epidermoids of the head and neck. (1995) Radiographics : a review publication of the Radiological Society of North America, Inc. 15 (6): 1437-55.
2. Shibata T, et al. Magnetic resonance imaging features of epidermoid cyst in the extremities. Arch. Orthop. Trauma Surg. (123) (2003), pp. 239-241
3. Hakyemez B, et al. Flair and diffusion weighted MR imaging in differentiating epidermoid cysts from arachnoid cysts Tani Girisim Radyol. 2003 Dec;9(4):418-26.
4. Meyer I. Dermoid cysts (dermoids) of the floor of the mouth. (1955) Oral surgery, oral medicine, and oral pathology. 8 (11): 1149-64.
5. Li X, et al. A Review of the Role of Sebum in the Mechanism of Acne Pathogenesis. J of Cosmetic Dermatology. 2017;16(2):168-73.
6. Suzuki C, et al. Apparent diffusion coefficient of subcutaneous epidermal cysts in the head and neck comparison with intracranial epidermoid cysts. Acad Radio . 2007 Sep;14(9):1020-8.

back

2025.3.7