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Case Report

Colloid cyst: an unusual location of cervical spinal

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Abstract: The cyst was incidentally discovered in a 57-year-old male who suffered a chronic left arm numbness. Clinical examination found asymmetric incomplete sensory disturbances. MRI results showed that the ventral spinal cord lesions pushed back the spinal cord, leading to slight local edema of the spinal cord. Opening the second cervical spine in the surgery, we found the lesion adhered to the local spinal cord in the microscope, and the lesion capsule cannot be completely peeled. Colorless, transparent gel-like cyst fluid was extracted intraoperative, and further removal of the cyst wall was made. Postoperative pathology found characteristic epithelial-like cilium epithelial cells and goblet cells in the respiratory tract, and typical mycelium-like protein aggregates distribution was found in the cystic fluid. The cervical spinal colloid cyst was diagnosed, and postoperative the patients had complete remission of sensory dysfunction.

Keywords: Spinal cord, cervical spinal, colloid cyst, uncompleted paralysis

Introduction

A colloid cyst is a rare benign tumor accounting for approximately 0.5% of intracranial tumors [1], which is commonly found in the anterior part of the third ventricle among people between the ages of 30 and 50. A colloid cyst is usually associated with cerebrospinal fluid outflow tract obstruction, which is closely related to Monro [2]. It is derived from endoderm tissue and is a special type of teratoid cyst. When the colloidal cyst ruptures, the cyst contents overflow and cause an inflammatory reaction, forming yellow granuloma in the third ventricle [3]. Usually, since the generation of corresponding clinical symptoms is found after examination, surgical excision can completely relieve the symptoms of oppression. The disease usually heals well. Clear cystic lesions in the MRI are typically accompanied by reactive edema around the tissue [4]. Intracranial lesions are often diagnosed with severe obstructive and compressive symptoms. Non-third ventricle pathology has occasionally been reported [5]. However, no cases of onset of the spinal cord have been published yet. We treated one case of colloid cyst invading the cervical spinal cord. Now the first clinical report of spinal colloid cyst is given as follows.

Case report

Male, 57 years old, with left limb numbness for 1 year due to neck discomfort, went to the hospital after 3 months' aggravation. One year ago, the patient had left upper limb numbness with no obvious incentive, which aggravated gradually. The neck discomfort was relieved after repeated rehabilitation therapy and other symptomatic treatment, but the numbness of the limbs had no significant relief. During the recent 3 months, the above symptoms aggravated. At the time of treatment, the muscular tension of the limbs was normal. The muscle strength of left limb was 4; the muscle strength of the right limb was 5. The left limbs had deep sensory disturbances and meticulous tactile disturbances; the sense of pain and warmth decreased on the right side of the skin below the back occipitalis. Patellar tendon reflexes are active on the left side. The Babinski sign on the left is positive. Cervical spine MR plain scan and enhanced scan show: in the front left of the intramedullary level spinal cord of neck 2, irregular long T1

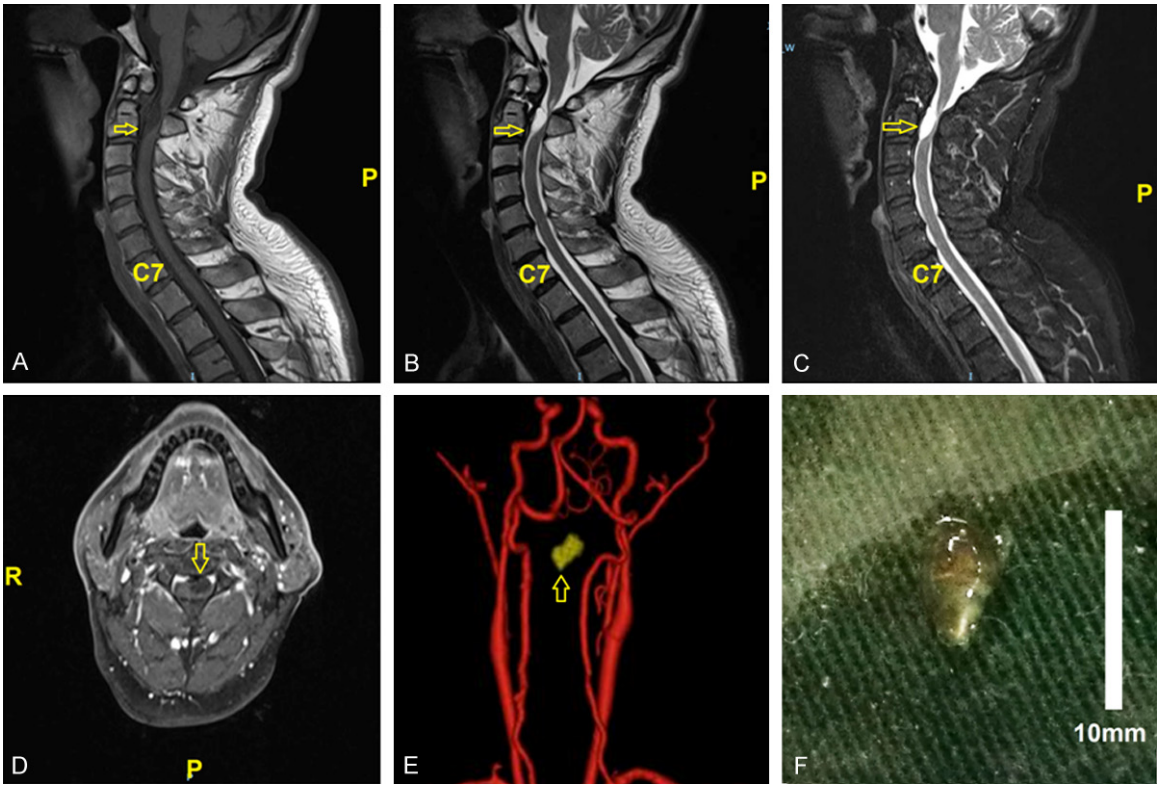

Figure 1. MRI scan of the cervical colloid cyst shows in the front left of the intramedullary level spinal cord of neck 2, irregular long T1 (A) and long T2 (B) signal shadow can be seen. Fat saturation sequence signal was high (C). The corresponding level spinal cord narrowed significantly after oppression and shifted to the right (D). There is no obvious blood vessel around the tumor (E). 0.6 ml of cyst fluid was extracted, which are colorless transparent gel (F). The yellow arrow points at the tumor, P points at the rear side and R points at the right side.

and long T2 signal shadow can be seen. Fat saturation sequence signal was high, with a size of about 0.8 cm × 1.5 cm × 1.5 cm. The corresponding arachnoid membrane lower plenum widened.

The spinal canal was significantly narrower. The corresponding level spinal cord narrowed significantly after oppression and shifted to the right. The boundary between the lesions and the spinal cord is clear. Inside the spinal cord, patchy isometric T1 and isometric T2 signal shadow can be seen. The edge is acceptable. The fat saturation sequence showed a high signal, and no definite enhancement was seen in the enhanced scan of the spinal canal (**Figure 1A-F**).

After perfecting other examinations, cervical spine decompression and tumor resection under the microscope were performed. During the surgery, the ligaments between the neck 2 and the adjacent cervical spinous process were cut off, and the spinous process of neck 2 was bitten off with a rongeur. The spinal dura mater was cut open along the midline under the microscope, revealing the horizontal ventral of neck 2. The solid lesions of the subdural cyst were seen, with thin cyst wall. The cyst was sucked with a syringe, and about 2 ml of jelly-like liquid was sucked out. Expanding the fistula orifice, jelly-like crystals (**Figure 1F**) were visible, which were scraped off and saved as pathology. The solid part of the tumor was gray, tough, and adhered to the nerve root, without an apparent envelope. The border was separated while the tumor was removed by blocks. Most parts of the tumor were removed. The residual cavity was repeatedly washed. The spinal cord fluctuates well. Symptoms of hemiplegia of the patients were remitted entirely after the surgery.

Postoperative pathological findings showed that the tumor contents were mucus, showing a radial mycelial-like structure mixed with the liq-

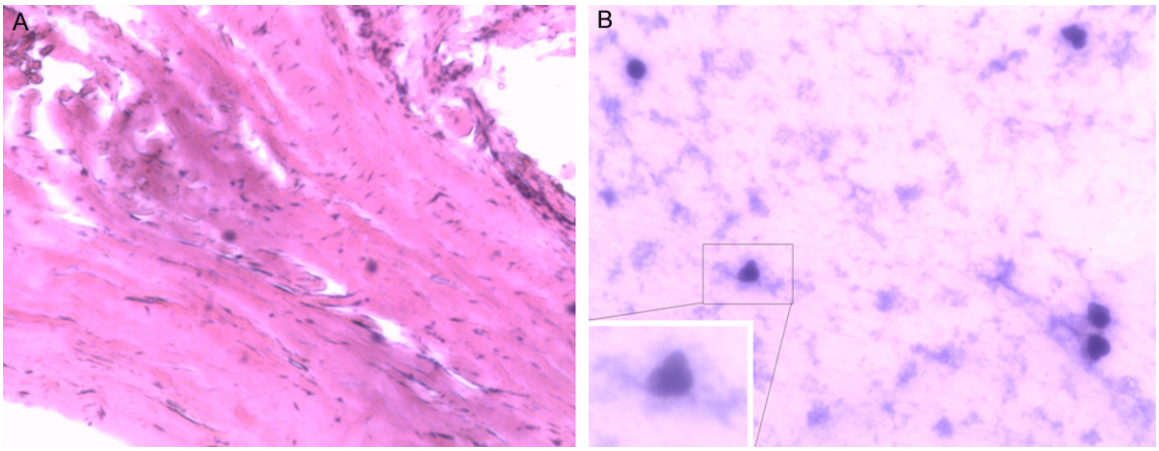

Figure 2. Surgical histopathologic section shows cyst wall epithelial HE, staining shows pseudostratified epithelial structure. The outer layer is collagen fibers connective tissue, 100 folds (A). Pap staining of the content shows radiated mycelial structure of diagnostic value, 100 folds (B).

uid contents. The cyst wall epithelium is a pseudostratified epithelium composed of ciliated epithelium and goblet cells (**Figure 2**). Colloid cyst in the cervical spinal cord was considered.

Discussion

A colloid cyst is common in the anterior part of the third ventricle, rare in children, usually seen in 30-50 years, often associated with cerebrospinal fluid outflow tract obstruction and close to Monro hole [1]. The current literature occasionally reported colloid cyst in other locations in the brain, but no spinal colloid cyst was reported [5]. The cyst contains the viscous mucus-like substance, which solidified quickly once fixed. The covered epithelium shows columnar long ciliated cells and goblet cells if well preserved, or short cubic epithelium due to the oppression of the cyst contents [3]. The epithelium and fibrous thin fibrous capsule were separated only by the basement membrane, which is not evident in the light microscope.

Within the cyst is PAS-positive substance. The mycelium-like structure formed by denatured nuclear proteins is common. In the absence of visible epithelium, this feature has diagnostic value [6]. The cyst contents overflow when the colloid cyst ruptures and cause an inflammatory reaction, and then in most cases will lead to the so-called yellow granuloma in the third ventricle. Colloid cyst originated in endoderm tissue, is a particular type of teratoid cysts. The epithelial type conforms to the typical respiratory mucosa, and the glycocalyx-like structure at the top of the coat is an ultrasonic feature of the specific endoderm-derived epithelium [6].

Cervical spine cysts are often dermoid cysts, epidermoid cysts, teratoid cysts, and teratoma. The first two are derived from the ectodermal tissue. The dermoid cyst contains only epidermal tissue and keratosis. In addition to the epidermis and keratosis, the epidermoid cyst also contains the dermis and epidermal annexes such as sweat glands, sebaceous glands, hair follicles and so on. Teratoma includes three germ layer structure, while teratoid cyst includes two germ layer structure [7]. CT and MRI have apparent advantages in the diagnosis of endothelium-like canal cyst, epidermoid cyst, or teratoma. Both can show the heterogeneity of the tumor well. In the MRI images, both epidermoid cysts and dermoid cysts showed a high signal of T1 or equal signal. The signal often shows complete cyst wall, containing the signal of fat, with or without tumor enhancement nodules. In addition to the tumor, spina bifida or the lowest dysplasia are often found [6].

Intranasal lipoma is actually not a true tumor. Its histological origin is not clear. It's usually accompanied by other congenital malformations, such as spinal bifida, spinal bulging and so on. Intraspinal arachnoid cyst originated in the arachnoid tissue of the spinal cord, which needs to be identified by pathology [2].

The intraspinal colloid cyst should be distinguished from another type of teratoid cyst enterogenous cyst, which, histologically, are mainly endoderm structures. Intraspinal enterogenous cysts are a rare developmental deformity disease that can compress the spinal cord or cause tethering [8]. These cysts originate from the chordal remnants formed by the fusion of endodermal epithelial tissue. It is most common at the junction of the neck and the chest, or any part from the cerebellopontine angle to the sacrococcygeal region, and can occur in the lateral, posterior of or inside the spinal cord [9].

The cyst wall is composed of multiple, single-layered, columnar epitheliums with ciliated structures, with basement membrane and connective tissue underneath. MRI cannot distinguish between the two. Pathological identification methods mainly evaluate epithelial origin and cyst contents. Enterogenous cysts are compact fibrous cyst formed by cubical epithelium or columnar epithelium, containing glycoprotein or mucus protein deposition. And the staining of CEA antibody is positive [10].

The respiratory epithelial cells of colloid cyst belong to the pseudostratified cilia columnar epithelium, mainly composed of columnar, cup-shaped, spindle and cone-shaped cells of different shapes. It looks like stratified epithelium, but in fact, all bottoms of the cells are attached to the basement membrane, belonging to the simple epithelium, thus called pseudostratified columnar epithelium. There are cilia on the epithelial surface. The goblet cells can secrete mucus. Epithelial cells of the enterogenous cysts are epithelial cells of the digestive tract. The large epithelium of the gastrointestinal tract belongs to the simple columnar epithelium. While epithelium of the two ends of the gastrointestinal tract, i.e., the oral cavity, pharynx, esophagus, and anus, belong to the stratified squamous epithelium. Therefore, the difference between the cell ultrastructure can be used to identify the two.

In conclusion, colloid cysts are considered as the first diagnosis of a round well-defined mass located in the anterosuperior part of the third ventricle. But it is first reported in the spinal cord. An increasing number of publications reporting preoperative misdiagnosis of a colloid cyst. The diagnose of colloid cysts in spinal cord should be carefully made by epithelial cells and the characteristic protein structure of mucus.

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Disclosure of conflict of interest

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