



Case report

A 23-years old male was referred with painful mass on the Right fibular head for three month after minor trauma on the knee, progressive motor weakness of dorsiflexion of the ankle and toes, and eversion of the foot and hypoesthesia of the peroneal nerve territory were developed gradually. Electromyography (EMG) revealed abnormal spontaneous activities in the examined muscles innervated by the peroneal nerve below

knee level, and motor nerve conduction velocity (NCV) study revealed slowed conduction velocity of peroneal nerve below knee level and diagnosed as incomplete paralysis of the common peroneal nerve. Ganglionic cyst typically image similar to fluid on MRI with a low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. After contrast administration, T1-weighted image shows significant contrast enhancement peripherally. In this case, MR imaging showed cystic mass in the postero-inferior portion of the

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fibular head, measuring about 16 mm in diameter with subtle peripheral rim enhancement on Gadolinium-enhanced T1-weighted images and high signal intensity on the T2-weighted image and intermediate

signal on the T1-weighted image of the peroneal nerve with extending to the proximal tibiofibular joint (Fig. 1, 2, 3). The mass around the fibular head was exposed with curvilinear incision in 5 cm length on the fibula head, and a pale tan to white colored ganglionic cyst was located within the peroneal nerve. Also, a stalk of cyst was extended to the proximal tibiofibular joint beneath the tibialis anterior muscle. We isolated and intralesionally excised the cystic mass originated from interfuniculi without microscope. Then, we carefully decompressed three funiculi that were stretched and attached to the lateral wall of the cyst. During dissection of the cystic mass from the nerve, one funiculus was removed with the cyst. The histologic finding of the specimen showed typical endothelial lining cells on the inner wall of the cyst, which is concomitant to the histology of the ganglion (Fig.4). Immediately after operation, complete loss of motor power was noted, so we applied ninety degrees ankle stop short leg

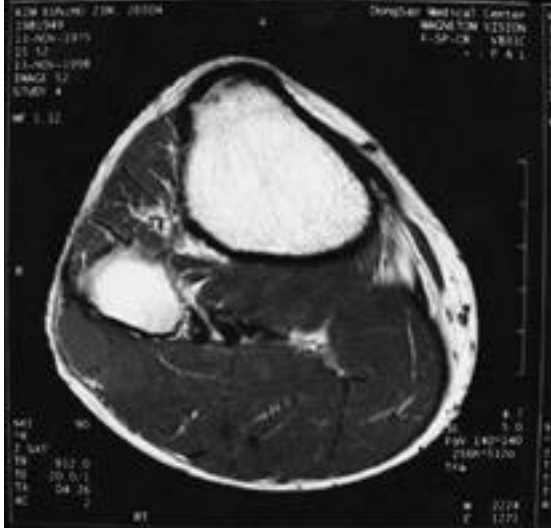


Fig. 1. T1-weighted images (TR/TE: 912/20) transverse images show a mass at just below the knee level. The ganglion cyst is seen as round mass of intermediate signal intensity near the fibular neck.

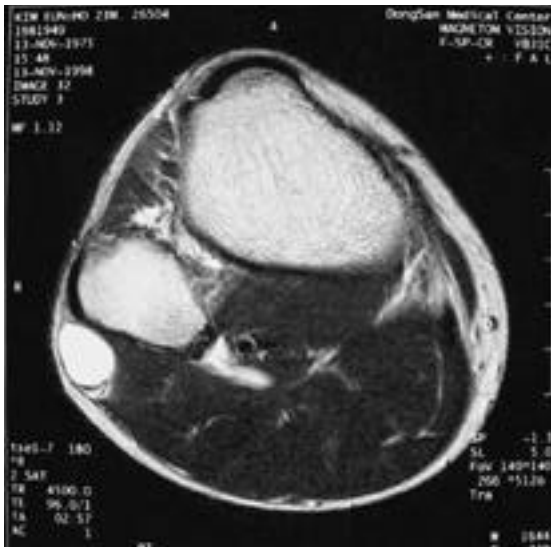


Fig. 2. T2-weighted images (TR/TE: 4500/96) at the same level as Fig.1 showing the high signal from the cyst.

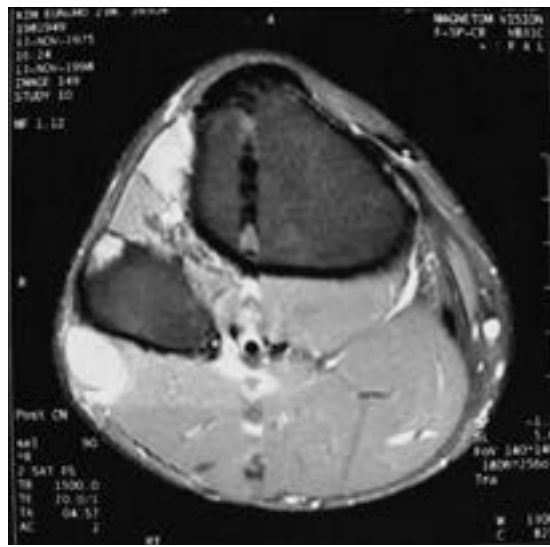


Fig. 3. Gadolinium-enhanced T1-weighted images (TR/TE: 1500/20) at the same level as Fig.1 showing peripherally enhanced cyst.

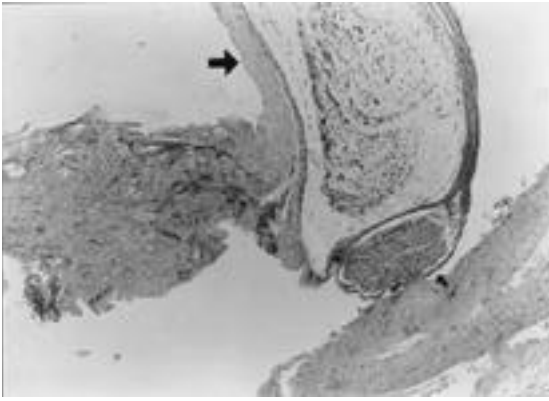


Fig. 4. Light micrograph shows a fibrous connective tissue, a portion of cyst wall (large arrow), which is connected, with sheath of adjacent nerve (small arrow). The cystic wall is not lined by synovial cells (H & E stain, 100)

brace. We checked periodically the change of the neurologic sign with a month interval. The findings of EMG & NCV checked at 4 weeks after the operation, revealed no interval change, compare to the preoperative finding despite of an aggravation of the motor power. At 4 months after the operation, motor function started to recover and had recovered completely at 7 months follow-up.

Discussion

Ganglionic cysts in the peroneal nerve are rare but well recognised entities after the first description by Duchenne in 1801^{1,2,3,8}. Nucci reviewed the literatures and found 60 cases⁹.

The pathogenesis of ganglionic cyst found in the common peroneal nerve, is still controversial. Cobb reviewed many literatures and several hypotheses were proposed for the ganglionic cyst within the nerve including mucinous degeneration or metaplasia of the perineural connective tissue, normal response to a stimulus to the specialised connective

tissue forming joints and nerve sheath or intraneural haemorrhage with reabsorption of the hematoma. However, Cobb believed that ganglia arising from the joint capsule are a different entity, and they may cause dysfunction by extrinsic pressure on the nerve, not intraneural¹². Scherman suggested that they are formed from myofibroblasts outside the nerve and subsequently invade the nerve sheath and myofibroblast was confirmed by electron microscopy¹³. Currently, the synovial theory is the most consensus regards these lesions as genuine cysts of articular or para-articular origin^{1,8-10,13}. The stalk connecting the cyst to the superior tibiofibular joint seen in about 40% of reported cases is said to be an important point of this theory. The same findings in our case are also consistent with this theory. For the diagnosis of the ganglion cyst of the common peroneal nerve, clinical combination is said to be diagnostic, whether or not there is a palpable swelling at the fibular neck¹¹. There have been reports about diagnostic modalities including ultrasonography, computed tomography, MRI were used^{1,3,4,6,8}. Coakley reported that the finding of a tubular structure near the fibular neck extension towards the superior tibiofibular joint and intermediate T1 and high T2 signal intensity of the cyst with increased signal in the peroneal compartment in association with clinical and EMG evidence of denervation are noteworthy^{2,15}. The findings of MR imaging of our case showed very similar findings described by Coakley. The image of MR imaging was helpful for diagnosis and preoperative planning for the surgical excision of the mass. Various treatment regimens have been reported over the years, some surgeons recommend the injection of sclerosing agent and others prefer radiotherapy¹². In our

opinion, operation is the treatment of choice if palsy is evident. Even though some surgeons^{2,5,9,13,14)} prefer subtotal removal of the cyst due to nerve damage by total removal. Nucci et al said that the accurate dissection made possible by operating microscope often permits total removal of the cyst without damage of the nerve fascicle, thus providing the conditions for good functional recovery^{8,15)}. In our case, total removal of the cyst was performed. In spite of the iatrogenic resection of one funiculus during operation, our patient showed almost complete recovery of the function at 7 months after the operation. So, cause of neurologic impairment seems nerve retraction in our case. According to the literature, clinical improvement varies from gradual recovery to nearly full recovery. However, we believe that clinical improvement depends on the severity of the nerve damage caused by the cyst and most of all, meticulous dissection of the cyst.

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Abstract

**Ganglionic Cyst of the Peroneal Nerve
- A Case Report -**

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A Common peroneal nerve palsy caused by ganglionic cyst is very rare condition but well recognised entities. There have been three previous reports describing the magnetic resonance image (MRI) findings of peroneal nerve entrapment due to a ganglionic cyst. Ultrasonography, MRI, and electromyography (EMG), nerve conduction velocity (NCV), and microscopic examination were taken for diagnosis. A tubular structure near the fibular neck extending longitudinally over several slices with an inferior extension towards the superior tibiofibular joint with high T2 signal intensity was characteristic. The peroneal nerve was exposed and the ganglionic cyst was excised. The nerve was paralysed immediately after operation, but at 4 month after operation, started recovery of the function gradually and has recovered completely at 7 month. MRI is helpful to detect the extent, location, and origin of the cyst. Meticulous surgical excision can provide favorable result.

Key Words: Ganglionic cyst, Peroneal nerve, MRI, Excision

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