Gavin Publishers
Gavin Journal of Case Reports
Volume 2016; Pages 3
Sevimli R et al.

Case Report

Drop Foot Developed Secondary to Peroneal Nerve Located Intraneural Ganglion Caused by Proximal Tibiofibular Joint: Case Report

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Citation: Sevimli R, Karakaplan M, Korkmaz MF, Salih AH (2016) Drop Foot Developed Secondary to Peroneal Nerve Located Intraneural Ganglion Caused by Proximal Tibiofibular Joint: Case Report. Gavin J Case Rep 2016: 10-12.

Received: 11 May, 2016; **Accepted:** 21 June, 2016; **Published:** 5 July, 2016

Abstract

Peroneal intraneural ganglion cyst which manifests itself with the complaint about palpable swelling and pain around the knee laterally adjacent to fibula neck, that peroneal nerve passes through, is a pathology that can lead to neurological symptoms. For the diagnosis of peroneal intraneural ganglion cyst, which is a rare reason for drop foot, physical examination, electromyography and radiographic imaging methods are used. In this case report, we aim to present peroneal nerve located intraneural ganglion cyst, which is a rare reason for lower extremity paralysis, of a 11 year old male patient who applied our clinic with the picture of painful swelling on outer-side of his knee and drop foot. We believe that surgical intervention should be performed in the shortest possible time with early and true diagnosis in order to regain of neurological functions completely in case of peroneal intraneural ganglion cyst.

Keywords

Intraneural Ganglion cyst; Knee; Peroneal nerve; Tibiofibular joint

Introduction

Neurological symptoms are commonly encountered after the peroneal nerve entrapment. Generally, one of the rare reasons of this situation is intraneural localized ganglion cysts [1]. Peroneal intraneural ganglion cyst with causes cannot be fully elucidated and that its pathophysiology today is still the subject of controversial subjects, is derived from tibiofibular joint according to some authors [2,3] and according to some others it's thought to be forming as cystic degeneration of own nerve sheath [4].

Peroneal intraneural ganglion cyst is more common in adult male population and rarely seen in childhood [5]. To prevent the complete loss of neurological functions and to regain the lost functions completely, it is essential to accelerate the diagnosis and treatment processes and perform surgical intervention in the shortest time possible, especially in children [6].

In this study of ours, we aimed to show that neurological losses can be reversed in shortest time after true diagnosis and fast surgery of the patient who has applied to us with a rare peroneal nerve localized intraneural ganglion cyst diagnosis.

Case Report

11 year old male patient assessed due to complaints about swelling and pain in left leg knee lateral and gait disturbance, admitted to our polyclinic upon that his complaints started two months ago and for the last couple of weeks there is gradually growing weakness in the foot and loss of movement. In physical examination of patient, without a history of trauma, beside the soft tissue swelling at the level of left fibula head, dorsiflexion and loss of pronation were detected in the left foot.

In the Electromyography (EMG) made in external centers, decrease in motor response of peroneal nerve and conduction blockage was detected starting from fibular head level and in MRI examination deep soft tissue localized cystic mass lesion 3.1 x 2.6 x 1.1 cm in size was detected adjacent proximally to tibiofibular joint, extending from fibular head to proximal along the nerve trace (Figure 1a,b). By entering the patient under general anesthesia, through posterolateral longitudinal 10 cm incision extending to knee posterior in accordance with the peroneal nerve trace and exploring after passing through the dermal and subcutaneous tissues, it was seen that the cyst had been derived from peroneal nerve and extending along the articular branch anteriorly at the tibiofibular joint level (Figure 2a,b). Articular branch was cut and the mass was removed after distal cyst fluid was drained from the proximal by milking movement. In follow-up checks of the patient diagnosed with ganglion cyst in histopathological examinations, recovery of nerve functions was detected in the 3rd month (Figure 3a,b).

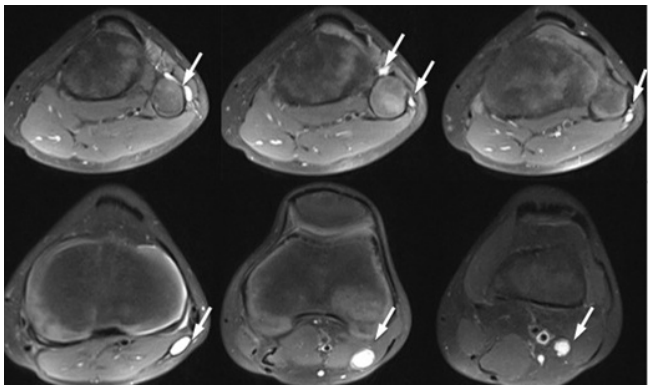

Figure 1a: In radiological examination of the case, intraneural ganglion cyst, extending to proximal along the common peroneal nerve by attaching to deep and superficial branches of peroneal nerve, is shown in sequential MRI (2 mm) images obtained in liquid sensitive sequences in axial.

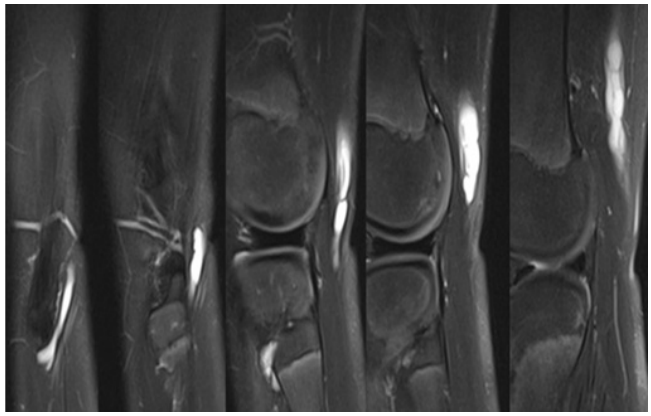

Figure 1b: Sagittal plane.

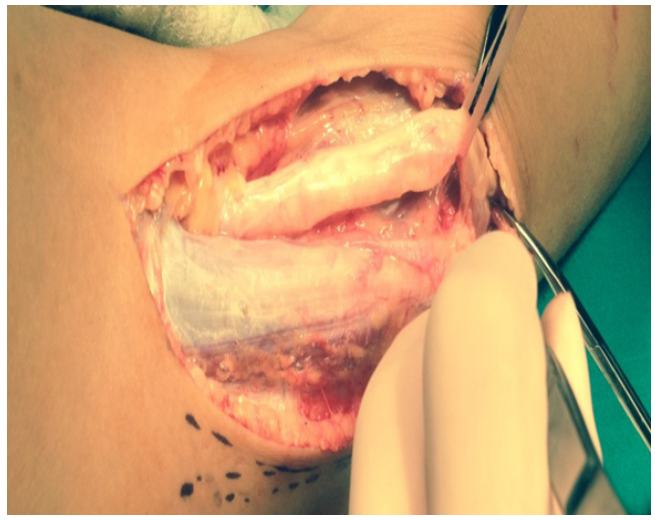

Figure 2a: Intraneural ganglion cyst extending along intra operative peroneal nerve to proximal of the case.

Figure 2b: Drained cyst content during neurolysis.

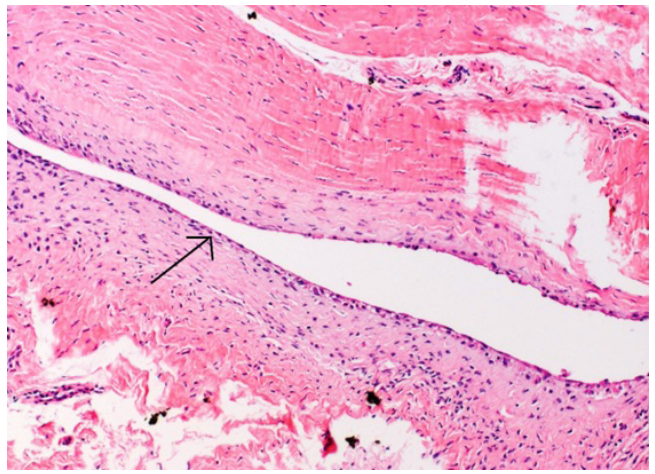

Figure 3a: While the first picture shows concentric fibrosis on the cyst wall and the cells lined with flattened epithelium in the lumen (HE, X100).

Discussion

Ganglion cysts are derived from mucoid transformation of connective tissue [2-4]. It's becoming a widespread opinion that this mucoid transformation occurs as a result of the cellular hyperplasia and it arises after the increasing of the mucoid substance and formation of one or multiple cysts which in turn merging with each other [3,4]. Intraneural ganglion cysts settle on the nerve's sheath and frequently cause problems due to compression. Early diagnosis and early surgical

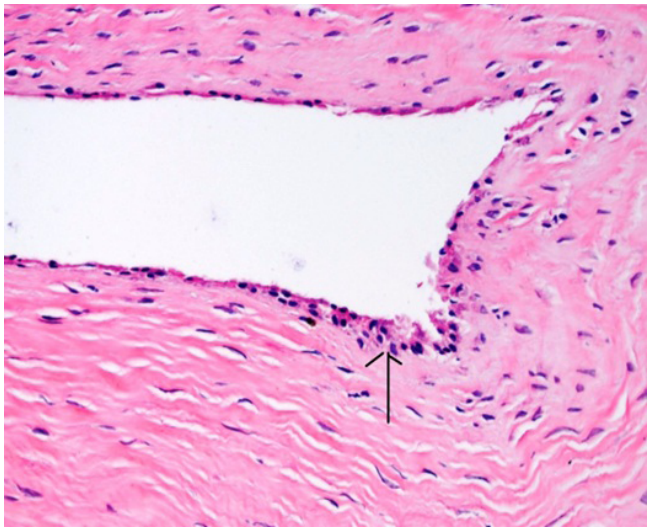

Figure 3b: The second picture shows cyst lumen, synovial-like lining cells in the lumen and compact connective tissue in the wall (HE, X200).

treatment are important to prevent permanent nerve damage. In early diagnosis, beside physical examination tests such as, MRI, ultrasonography and EMG are important. Intraneural-extraneural discrimination and revelation of joint connection, if present, should be done preoperatively [5,6].

According to synovial (articular) theory, first of two known theories about peroneal intraneural ganglion formation mechanism, ganglion is caused by proximal tibiofibular joint and extend along recurrent articular branch dissecting the epineurium between nerve fascicles to proximal toward deep-superficial peroneal nerve, common peroneal nerve and sometimes sciatic nerve, and according to the second theory, cyst formation occurs by myxoid degenerative changes in nerve sheath [7,8]. Also in this study of ours, imaging and operational indications showed that ganglion is derived from nerve's articular branch and extends to peroneal nerve with deep-superficial branches, and was in a way to support the synovial theory.

Detailed neurological, radiological and orthopedical tests were performed also in our case. Peroneal intra-articular ganglion treatment is surgery, surgery should be done as early as possible in these cases, not be delayed. Eliminating the connection between the cyst and the joint by cutting the articular branch out is important as well as decompression of the cyst, during surgery [9].

Drop foot is a clinical picture appearing after attenuation and weakness of the muscles responsible for dorsiflexion of ankle. It is frequently seen in peroneal nerve related lesions [10].

Drop foot, also present in our case, was caused by ganglion cyst, which was derived from peroneal nerve's articular branch and extending to common peroneal nerve with deep-superficial branches, localized at fibula head. In our case improvement in nerve functions was obtained in the third month after surgery.

In children, in patients scheduled for treatment with the diagnosis of peroneal intraneural ganglion, after treatment to achieve the best clinical outcomes and to return to full nerve function, before or after the pressure findings begin, surgery should be planned as soon as possible.

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