Intraneural Ganglionic Cyst of the Peroneal Nerve

Case Report

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Cystic intraneural tumors filled with gelatinous material and referred to as "ganglions" are rare in peripheral nerves. The lesion has been clearly described in the orthopedic and surgical literature.1,2,4,10,12 No description of this condition was found in the better known pathology, neuropathology, neurology, or neurosurgery texts. The only neurosurgeons who appear to have written about intraneural ganglions are Stack, et al.,12 in an article published in an orthopedic journal.

We have recently treated a single case of peroneal nerve ganglion successfully and feel that this entity deserves neurosurgical attention.

Case Report

This 28-year-old man came to our attention on February 13, 1968, because of a 1-month history of throbbing pain in the lateral aspects of the right leg. History was negative for past or recent injury, illness, allergies, or exposure to toxins. A single episode of low-back strain 2 years earlier was described, but examination and lumbosacral x-rays at that time were negative.

Examination revealed tenderness along the upper third of the right fibula, without local inflammation or mass. No motor or sensory abnormalities were present. An x-ray of the right knee showed only an unusually large head of the fibula. In the ensuing 2 weeks, there was rapid progression of pain symptoms.

Examination. The patient was hospitalized on February 29, 1968, with findings of complete flaccid paralysis of the extensor hallucis longus, peroneal muscles, partial weakness of the extensores digitorum, and mild paresis of the anterior tibial muscle. A sensory deficit was present (touch and pain) on the dorsum of the right hallux, first dorsal interosseous space, and dorsum of the foot to the lateral maleolus. Pressure at the fibular head elicited paresthesias in the dorsum of the foot. No evidence of neurofibromatosis was found. No sciatic distribution of pain was elicited with straight-leg raising.

X-rays of the lumbar spine were negative. A myelogram done March 2, 1968, revealed no abnormality. The spinal fluid protein was elevated, however, to 83 mg%. Urine examination for lead, arsenic, and porphobilinogen were negative. Glucose tolerance test and serum electrophoresis also were normal. Serum rheumatoid antibody tests and lupus erythematosis (LE) preparations were negative. Further physical examination finally disclosed, for the first time, a definite swelling of the common peroneal nerve, adjacent to the fibular head, extending behind the biceps femoris tendon.

Operation. Surgical exposure of the common peroneal nerve was accomplished on March 7, 1968; this revealed an irregularly nodular mass with an opalescent surface, measuring 2 1/2 inches in length and distending the common peroneal nerve to 3/4 inch diameter. The mass appeared larger proximally and extended to the region of the bifurcation of the nerve. The nerve grossly appeared normal proximal and distal to the swelling, and the nerve fascicles were stretched over a part of the surface of the mass (Fig. 1). Alongside the recurrent articular nerve was a rather thick (2 mm) white stalk about 5 mm long extending from the tibio-fibular joint to the common peroneal nerve at the bifurcation. The stalk was opened, and crystal clear gelatinous material bubbled out of both ends, apparently of the same quality seen in joint ("ganglion") cysts. This obviously softened and decompressed the cystic, intraneural mass. A fine neural dissector could easily be passed into the cystic tumor via the ostium of the stalk. Attempts to dissect the wall of the cyst from the nerve revealed marked adherence to neural tissue and the capsule was opened where it had evaginated to the

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Operative photograph showing peroneal nerve with intraneural lobulated cyst apparent at its surface. Right: Artist's drawing of "ganglion" invading right common peroneal nerve.

Pathological examination of the wall of the cystic tumor revealed non-serous-lined hyaline connective tissue with no neural elements present (Fig. 2).

Postoperative Course. The patient showed progressive improvement. An ankle brace, to prevent foot drop, was used for 6 months and then discarded as examination showed almost complete recovery of function of the extensors digitorum, peroneal, and anterior tibial muscles. The extensor hallucis longis remained flaccid, and the sensory deficit was unchanged. No tumefaction or tenderness was present.

Discussion

Descriptions of intraneural "ganglion" cysts of peripheral nerves have almost all been of the peroneal nerve, although median, ulnar nerves have also been involved with cystic tumors (possibly all of which were not "ganglionic" cysts). Parkes described dissection of ganglions of carpal cyst origin into the adventitia of arteries, both in the lower forearm and in the wrist. His description of involved peroneal nerves examined at surgery were similar to ours, particularly in noting the presence of a clearly defined pedicle stalk joining the intraneural cyst with the tibiofibular joint. In one of Parkes' cases, it was felt that there was a nerve branch (the recurrent articular nerve) which was separate from the stalk, and he surmised that the cyst followed the track of this nerve branch to the common peroneal nerve substance. This explanation would certainly correlate with our findings.

We suggest that the cyst was distended with the gelatinous material, and by stretching the nerve from within produced a progressive "pressure" neuropathy. The origin of...