IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 7 Ver. 15 (July. 2018), PP 20-22
www.iosrjournals.org

A Study of Sensory Deficit after Surely Nerve Biopsy

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Abstract:
AIMS : *A prospective study was conducted to determine the extent of sensory deficit after sural nerve biopsy (SNBx).*
Materials and Methods : *Patients who had SNBx between July, 2015 and May, 2017 were eligible for inclusion. But patients with sensory impairment in sural nerve territory or abnormal sural nerve conduction studies before the procedure was excluded. Touch, pain, temperature, vibration and joint position sense were tested after nerve biopsy. The extent of sensory deficit including other complications were noted. Follow up assessment was performed at 3 months and later.*
Results : *The study included thirty patients (16 women). The mean age was 38.2 (18-61 years). 28 (94%) patients had sernsory deficit along lateral aspect of foot and 29 patients (96%) had sensory impairment extending beyond outer aspect of 5th toe after 12 to 14 days of SNBx. At follow up sensory deficit was present in 88% and paresthesia in 38%.*
Conclusion : *Most of the patients developed persistent sensory deficit after SNBx.*
Key words*: Sural Nerve biopsy, complications, sensory deficit.*

Date of Submission: 16-07-2018 Date Of Acceptance: 30-07-2018

I. Introduction

Sural nerve biopsy (SNBx) is particularly useful in establishing the diagnosis of certain neuropathies like leprosy, vasculitic neuropathy, amyloid neuropathy, sarcoid neuropathy and chronic inflammatory demyelinating polyradiculoneuropathy (CIDP)[1]. In about two third of patients, the results of SNBx are likely to alter the management. However, the procedure is associated with a number of complications such as persistent sensory loss, pain and paresthesia in the territory of sural nerve, painful neuroma, and infection at biopsy site[2-6]. The extent of sensory deficit (Sdef) following SNBx varies widely. Therefore, it is prudent to balance the diagnostic yield of SNBx against the complications, so that a better informed consent can be obtained from patients.

II. Materials and Methods

The prospective study was conducted in Neurology and Neurosurgery department at Calcutta National Medical College, Kolkata. All consecutive inpatients were admitted between July, 2015 and May, 2017. But the patients with evidence of neurodeficit prior to the procedure or with abnormal sural nerve amplitude were excluded. Informed consent was obtained from all patients.

Technique : Under local anaesthesia, the sural nerve was exposed after making an incision midway between lateral malleolus and tendoachilles. Whole sural nerve biopsy was performed and a 2.5 cm. segment of the nerve was excised. Severed ends of the nerve were not sutured[7].
Sensory assessment : Detailed sensory testing for touch, pain, temperature, vibration and joint position was performed between 7th and 14th day after the procedure. Touch was tested using a wisp of cotton, pain using a sharp pin, temperature using test tubes containing hot and cold water and vibration was tested with a 128-Hz[8]. Sdef was considered to be present if there was absence or reduced perception of any of the modalities tested. Sensory assessment was also performed on the normal side (non-biopsied side). The sensory assessment was repeated after three months or later.

III. Results

A total of 30 patients (16 women) was included in the study. The mean age was 38.2 years (18 – 61 years). Pre-biopsy diagnosis included vasculities (20 patients), leprosy (6 patients) and CIDP (4 patients); some patients had more than one indication. The duration of symptoms ranged from 7 days to 6 years (mean 10 months). Findings obtained on nerve conduction studies are summaried in Table 1. All patients have normal sural nerve conduction and none had any sensory deficit in the territory of sural nerve prior to the procedure.

Sensory deficit : Sdef along lateral aspect of foot was presenting 28 (94%) patients. 29 patients (96%) had deficit beyond the outer aspect of fifth toe. Side effects over dorsal aspect of toes varied widely.

Other complication : Postoperative pain was present in 13 (44%), paresthesia in 11 (36%) patients. Infection at biopsy side was noted in 1 (4%).

Yield of nerve biopsy : SNBx yielded a definite diagnosis in 11 (36%) patients (Table 2). Out of the remaining 19 patients with normal findings of SNBx, the procedure was helpful in excluding vasculities in 7 patients. There was no correlation between the etiology or the extent of neuropathy and the complication rate.

Follow-up : A total 19 patients were seen at intervals ranging from 3 – 10 months (6.3 months) after the procedure. Sdef was presenting 16 *89%) and parasthesia in 7 (13%) patients. The wound had healed in one of the patients who had infection at the biopsy side 7 (39%) and had persistent pain at sural nerve territory. No patient had any impairment in the activities of daily life.

Table 1 : Summary of electrophysiological study of the patients

Findings	Number
Normal	13
Motor axonal neuropathy	8
Sensori-motor axonal neuropthy	6
Polyradiculopathy	3

IV. Discussion

Evaluation of peripheral neuropathy can be well established by sural nerve biopsy. Though this procedure has great influence in the diagnosis and management of peripheral neuropathy, it has several complications. These include persistent pain (67%)[2], dysesthesia, paresthesia, and sensory deficit in the sural nerve territory, neuroma formation at the severed end of the nerve and infection (10 – 15%)[2,4] at the biopsy site. These symptoms may persists for many months, 33% out of 54 patients reported parasthesia and 19% had dysesthesia after a follow up of 5 – 32 months[9]. Sensory deficit is another major problem as noted in 93% of patients in two studies[3,9]. The follow up period in these two studies were 28 and 5 – 32 month, in our study 88% had sensory deficit at a mean follow up cure of 1 year. The most consistent area of Sdef was lateral aspect of foot in 93% of patients. Sdef over dorsal aspect of foot was presenting all. Some studies showed the possible associated factor that may predispose the patient to develop sensory deficit following SNBx. In one prospective study the extent of Sdef at 6, 12 or 18 months did not differ between patients with and without diabetes mellitus[11]. However, in another study, mild persistent sensory symptoms were significantly more common in patients with diabetes mellitus (64%) when compared to patients without diabetes mellitus 28%). The follow up period was about 6 years[12]. No correlation was observed between the length of the nerve excised and the complication rate[4]. Pollock et al reported no significant difference in areas of sural sensory loss between fascicular and whole nerve biopsy group[13].

Table 2 : Final diagnosis of the patients as per sural nerve biopsy findings

Sural nerve biopsy	Final diagnosis	Number
Abnormal	Systemic vasculitis	8
	Leprosy	1
	CIDP	1
	HMSN	1
Normal	ADEM	8
	Multiple sclerosis	4
	Multiple cerebral infarcts	3
	CNS lupus	1
	CNS lymphoma	1
	Isolated CNS angiitis	1
	HIV encephalopathy	1

V. Summary

Sural nerve biopsy leads to sensory deficit in almost all patients, which may persist for many years. Our study has shown the extent of Sdef is variable and 94% has deficit beyond the region of sural nerve distribution. The most important fact is that the post biopsy complications are mild and almost never interfere with daily life activities.

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Dr. Nani Sen "A Study of Sensory Deficit after Surely Nerve Biopsy."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 7, 2018, pp 20-22.