LATERAL APPROACH : A BETTER TECHNIQUE FOR SPINAL ANAESTHESIA IN THE MODERN ERA

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ABSTRACT

The most commonly used technique in routine spinal anaesthesia practice is the midline approach, compared to the lateral or paramedian approach. With the better understanding of the technique and introduction of fine gauge spinal needles, this practice needs a rethinking. Lateral approach was used in 60 patients undergoing different surgical procedures below the umbilicus, using 24 or 25 gauge, Quincke spinal needle without an introducer. The result was gratifying. In 77% of the cases the subarachnoid space could be entered in the first attempt. There was no failure. No patient complained of postdural puncture headache or post operative backache. Only one patient reported paraesthesia during needle placement without any residual effect. Various other advantages of the technique are discussed. Thus with due practice, lateral approach is found to be superior in modern day spinal anaesthesia.

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KEY WORDS : Anaesthetic technique; Backache; Headache; Lateral approach; Spinal.

Introduction

Spinal anaesthesia (SA) is one of the most commonly used regional anaesthesia techniques. Due to economic consideration, this technique remains an important procedure for developing countries. Lateral or paramedian approach to SA is generally used only when midline approach has failed or is not possible due to various anatomical factors like ankylosing spondylitis [1], vertebral body osteophytes etc. The preponderance of calcification of supraspinous and interspinous ligaments in the geriatric age group adds to the difficulties of midline approach. The use of large gauge spinal needles and introducer needles have their own detrimental effects. Modern regional anaesthesia practice demands least discomfort to patient and precision on the part of the anaesthesiologist. It is rather unfortunate that some of the anaesthesiologists still use 18 or 20 gauge (G) spinal needles for SA with utter disregard to patient comfort and associated complications.

Lateral approach to SA was successfully tried in 4 cases where general anaesthesia was not preferred due to various reasons and midline approach to SA was not favourable or possible. Encouraged by the success of these cases, a study was conducted to evaluate the efficacy, advantages and possible complications of lateral approach and its role in modern anaesthesia practice.

Material and Methods

This prospective study comprised 60 ASA I, II and III grade patients of either sex undergoing elective surgical procedures below the umbilicus. Patients with history of backache and those

reporting for caesarean section were excluded to detect accurate incidence of headache and backache. Informed consent was taken from all the patients. Premedication included diazepam 0.2 mg/kg the night before and 0.1mg/kg at 6.30 am on the morning of operation. All patients were preloaded with 15 ml/kg of Ringer's lactate solution and placed in lateral decubitus position.

A small skin wheal was raised with 26 G needle, about 1.5 cm from midline on the dependent side, directly opposite the centre of interspace between L2-3 or L3-4 vertebral spines depending on the anatomical suitability. Then deeper tissue was also infiltrated using same solution (0.5% lignocaine) to ensure maximum comfort to the patient during subsequent probing. A 24 or 25 G short bevelled spinal needle (Quincke) was inserted through the wheal without an introducer and directed somewhat medially and if needed cephalomedially. The number of attempts needed to get the successful spinal tap was noted. Then, after injecting the required quantity and type of local anaesthetic solution, the patients were turned supine. Rest of the procedure was same as done for the midline approach.

Monitoring of ECG, heart rate, blood pressure and pulse oximetry was done and managed accordingly. Observations were also recorded in respect of haemorrhagic tap, damage to spinal needle, neurological sequelae, post-dural puncture headache (PDPH) and backache. The satisfaction level of the patients was also recorded.

Results

Age of the patients varied between 19 and 76 years, of whom 36 were males and 24 females. In 46 patients (77%), successful tap could be achieved in first attempt, whereas 10 patients (17%) needed second probing and remaining 4 (6%) needed three attempts. There was no failure.

Only one patient complained of non specific headache postoperatively (Table-2) and 2 patients had initial haemorrhagic tap which became clear soon after. None of the patients complained of backache and only one patient reported paraesthesia during needle insertion without any residual effect. No damage to the spinal needle was reported in any of the cases. The degree of satisfaction with the technique on a 3 point scale (Table-3) was reported to be

pleasant in 42 patients (70%) and tolerable in 15 patients (25%). 3 patients (5%) reported unpleasantness and these were apprehensive patients who did not cooperate fully during the procedure. Another noteworthy finding was that, 12 of the patients who had undergone surgery under SA previously, disclosed that they had minimal or no discomfort with present technique, compared to their past experience (with mid line approach).

TABLE 1
Number of attempts to achieve successful tap

Attempts	Number of patients	Percentage
First	46	77%
Second	10	17%
Third	4	6%
More than 3	0	0%
Total	60	100%

TABLE 2
Prevalence of side effects

Parameter	Frequency	Percentage
Headache	1	1.7%
Haemorrhagic tap	2	3.3%
Backache	0	0
Neurological sequelae	1	1.7%
Damage to spinal needle	0	0

TABLE 3
Satisfaction level of the patients

Level	Frequency	Percentage
Pleasant	42	70%
Tolerable	15	25%
Unpleasant	3	5%
Total	60	100%

Discussion

General as well as regional anaesthesia has become a challenging task for the anaesthesiologist in certain conditions like ankylosing spondylitis, due to various pathological changes [2,3]. Awake intubation for GA may not be acceptable to many apprehensive patients. Spinal anaesthesia by the classic mid line approach in which the needle traverses the entire supraspinous and interspinous ligaments, is usually unsuccessful in these patients. The calcification of ligaments in older patients may cause difficulty in pushing thin gauge needles. Moreover, the use of larger needle and needle introducer, will add to the discomfort and non-cooperation of the patient and increase the chances of PDPH and backache. Hence, SA using lateral approach seems to be a better option.

The terms lateral and paramedian approaches have

been loosely used for the same technique by most of the authors [4,5,6], whereas others have made minor differences in them based on the position of the needle centrally or caudally [7]. Though some authors have recommended paramedian approach for thoracic epidural anaesthesia to avoid difficulties presented by angles of thoracic spinous processes [4,6,8,9], very little has been said about using paramedian approach for routine SA. Stray cases of using lateral approach for SA in ankylosing spondylitis have been reported [1,10,11], but its use in routine SA has not been advocated by any author.

The outcome of this study was encouraging as can be seen from the results. None of the patients complained of backache in this study. The incidence of backache as reported by various authors varies from 8.12% to 38% during SA [12,13]. The reason for backache can be due to multiple punctures, injury to ligaments, use of larger needles or introducer needles and unaccustomed acute flexion of spine. All these factors were avoided in this study. With the lateral approach, flexion of the back is not so important. Thus this technique is of great help specially in obesity, late pregnancy and mild spinal deformities. Moreover, supraspinous and interspinous ligaments which may be bony hard at times, are avoided by this technique. So, there is minimal trauma and discomfort to the patient. This is further facilitated by not using introducer needle. The incidence of headache using 26 G spinal needle, has variably been reported as 0.4%, 7.5% and 37.2% by different authors [14,15,16]. This wide range of variation may be due to factors like age, sex, individual tolerance and number of dural punctures. Absence of typical PDPH in present study may have been due to adequate perioperative hydration, single dural puncture with a fine needle, cases selected and of course, less number of cases studied. Silverman et al have reported that there is less leakage of C.S.F. with the lateral approach, hence, less chances of PDPH [17]. Though the incidence of PDPH is minimal with 29 G needle, technical difficulties and more failure rates (8-17%) are reported apart from irreversible damage to needle [15,18].

The sense of touch and needle control are more accurate with lateral approach and the depth space can be accurately ascertained [6]. There is less chance of bending or kinking of fine needles as tough ligaments are avoided. Theoretical risk of iatrogenic epidermoid tumour from implantation of epidermal tissue at the time of lumbar puncture can be prevented by pricking the anaesthetised skin with a wide bore needle at the level of insertion of spinal needle.

It is concluded, that lateral approach to SA should be encouraged in the modern day regional anaesthesia practice in the overall interest of the patient. The midline approach can be restricted to the beginners and in patients of younger age group. Though the study did not compare the efficacy of the technique vis-a-vis midline approach, the results are self evident and do not necessarily warrant a comparative study. With more experience and easier availability of finer needles (26-30 G) the technique can be further refined with or without using smaller gauge introducer needles (20,22 G) and adequate subcutaneous infiltration of local anaesthetic.

References

1. Mitra S, Sharma S. Approach to spinal anaesthesia in ankylosing spondylitis. *J Anaesth Clin Pharmacol* 1998;14:406-8.
2. Bluestone R. Arthritis and allied condition. In : Mc Carty DJ, editor. *A textbook of Rheumatology*. Philadelphia; 1979;610-32.
3. Sinclair JR, Mason RA. Ankylosing spondylitis - the case for awake intubation. *Anaesthesia* 1984;39:3-11.
4. Raj P, Pai U. Techniques of nerve blocking. In: Raj PP, editor. *Handbook of regional anaesthesia*. New York:Churchill Livingstone, 1985;157-257.
5. Mc Conachie I, Mc Geachie J. Regional anaesthesia techniques. In : Healy TEJ, Cohen PJ, editors. *A practice of anaesthesia*, 6thed. London : Edward Arnold, 1995;308-34.
6. Atkinson RS, Rushman GB, Davies NJH. Spinal anaesthesia - intradural:extradural. In : Lee's synopsis of anaesthesia, 11th ed. London : Butterworth Heinemann, 1993;691-745.
7. Field MJ, Wildsmith JAW. Spinal and epidural anaesthesia-practical aspects. In : Roberts CP, Brown BR, editors. *International Practice of Anaesthesia*. Oxford : Butterworth Heinemann 1996;2:139:1-22.
8. Blomberg RG. Technical advantages of the paramedian approach for lumbar epidural puncture and catheter introduction - A study using epidmoscopy in autopsy patients. *Anaesthesia*, 1988;43:837-43.
9. Bonica JJ. Continuous epidural block. *Anaesthesiology* 1956;17:626-30.
10. Kumar CM, Mehta M. Ankylosing spondylitis:lateral approach to spinal anaesthesia for lower limb surgery. *Can J Anesth* 1995;42:73-6.
11. Wittman FW, Ring PA. Anaesthesia for hip replacement in ankylosing spondylitis. *J Roy Soc Med* 1986;79:457-9.
12. Mandal P, Chaudhary S, Pawar DK, Kaul HL. Spinal Anaesthesia for day care surgery. *J Anaesth Clin Pharmacol*, 1994;10:261-5.
13. Donovan O, Healy N, Faragher EB. Post operative backache - the use of an inflatable wedge. *Br J Anaesth*, 1986;58:280-3.
14. Green BA. A 26 G Lumbar puncture needle; its value in prophylaxis of headache following spinal anaesthesia for vaginal delivery. *Anaesthesiology*, 1950;11:464-9.
15. Quaynor H, Corbey M, Berg P. Spinal anaesthesia in day care surgery with 26 G needle. *Br J Anaesth* 1990;15:766-9.
16. Flatten H, Rodt SA, Vannes J. Post dural puncture headache - a comparison between 26 G and 29 G needles in young patients. *Anaesthesiology* 1989;44:147-9.
17. Silverman DG, Connelly NR, editors. Epidural and spinal anaesthesia. In : *Review of Clinical Anaesthesia*. 2nded. Philadelphia:Lippincott Williams and Wilkins. 1997;123-7.
18. Dahl JB, Suheltz P, Anker - Moller E. Spinal anaesthesia in young patients using 29 G needle : technical consideration and evaluation of postoperative complaints compared to general anaesthesia. *Br J Anaesth* 1990;64:178-82.