

Comparing Sciatic Nerve Block in Novel Convenient Supine Position Via Medial Approach Versus Lateral Position Via Lateral Approach

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Abstract

Introduction: Popliteal sciatic nerve block performed in lateral position usually requires a change in position for the patient. This is time consuming and may cause discomfort to the patient.

Methods: This prospective study compared patients' preference and peri-operative outcomes in supine position via medial approach to the sciatic nerve and lateral position via lateral approach to the nerve. Prospective registration of this study with NHG Human Research Protection Programme was on 9 Sept 2021. Institutional review board approval was obtained for this study on 20 May 2022. All research participants provided written informed consent with the first patient enrolled on 05 June 2022.

50 patients from Ng Teng Fong General hospital (NTFGH) who were undergoing popliteal sciatic nerve block with or without sedation were recruited for the study and randomised to either receive the block in supine or lateral position.

Results: This study showed that there were significantly more patients in the supine group preferring to be in supine position during the block with p-value <0.001.

45.8% of patients who had the block performed in lateral position preferred supine position instead.

There was no significant difference in the peri-operative outcomes or duration taken for block completion. Most patients preferred to be in the supine position for popliteal sciatic nerve block as it was more comfortable.

Conclusion: Performing the block in supine position increased patient's comfort significantly and is non-inferior to performing it in lateral position in terms of safety, efficacy and efficiency profile.

Summary: What is known?

There is no existing literature comparing medial approach using our proposed novel convenient supine position versus lateral approach in lateral position regarding patient's comfort and secondary outcomes.



What is new?

Our new convenient way of positioning patient's lower limb to perform sciatic nerve block is safe and comfortable for our patients, especially in patients who have difficulty in changing position.

Summarise the implication(s) of this study on future research, clinical service, or healthcare policy.

Our study provides a new, safe and convenient way of positioning patients for sciatic nerve block in supine position that has been shown to provide greater patients' comfort and satisfaction that our anaesthesiologist colleagues can use in their clinical practice.

Keywords: Sciatic Nerve Block, Medial Approach, Lateral Approach

Abbreviations: NTFGH: Ng Teng Fong General Hospital, CAPS: Crosswise Approach To Popliteal Sciatic

Introduction

Performing popliteal sciatic nerve block in lateral position usually requires position change. It is time consuming and may cause discomfort to patient [1-3]. Medial approach described in current literature position patient's leg in figure-of-four which is difficult in patients with hip or knee conditions [4]. To perform the block in supine position, we propose a convenient way of positioning the patient's lower limb of interest placed externally rotated at the hip and knee flexed resting on the contralateral leg to access the medial side of the sciatic nerve in the popliteal fossa. We compared the peri-operative outcomes of this approach versus performing the nerve block using the lateral approach in lateral position.

We hypothesise that patients have greater comfort undergoing sciatic nerve block in our proposed position and comparable perioperative outcomes in these two approaches.

Methods

Institutional review board approval was obtained for this study on 20 May 2022. Prospective registration of this study with NHG Human Research Protection Programme was on 9 Sept 2021. All research participants provided written informed consent with the first patient enrolled on 05 June 2022.

This is a prospective randomised study. A sample size of 50 was calculated based on the minimum number required to achieve statistical significance of $p < 0.05$.

50 patients were randomised into two arms – medial approach in supine position versus lateral approach in lateral position. Block randomisation of patients was used to determine

whether the research participants received medial or lateral approach.

In the lateral group, patients had their lower limb of interest supported by a pillow between their legs. The block was done in an in-plane approach with respect to the ultrasound beam with a lateral to medial needle trajectory in the thigh.

For the supine group, the block was done in an in-plane approach to the ultrasound beam with the needle trajectory traversing from medial to lateral thigh.

All patients had lower limb surgery in NTFGH where popliteal sciatic nerve block was part of their anaesthesia plan. The patients were first assessed by their primary anaesthetist and were subsequently agreeable for sciatic nerve block from July 2022 to February 2024 before being recruited for the study.

Inclusion criteria

- Sciatic nerve block is planned as part of anaesthesia plan with or without sedation intra-operatively
- Assessed to be able to give informed consent for both surgical and anaesthesia plan
- Aged 21 years and above

Exclusion criteria

- Patients with contraindication to sciatic nerve block – coagulopathy, infection area, local anaesthesia allergy etc
- Patients whose planned anaesthesia treatment does not include sciatic nerve block
- Patient whose planned anaesthesia treatment include general anaesthesia and/or spinal anaesthesia

A single practitioner consultant anaesthetist performed all the sciatic nerve blocks.

All patients had standard ASA monitoring (continuous ECG, blood pressure monitoring, SpO₂, respiratory rate) throughout the procedure.

Linear ultrasound probe (Sonosite X-Porte, Fujifilm Sonosite, Inc., Bothell, WA, USA) and 100 mm echogenic needle (SonoPlex, Pajunk, Geisingen, Germany) were used. The blocks were done in-plane with real time ultrasound guidance.

All patients were given 0.5% ropivacaine with 1% lignocaine and adrenaline, with total dose of local anaesthesia kept within the toxic limit of local anaesthesia for their weight.

On post-operative day one, patients were assessed by the acute pain team in NTFGH as part of the nerve block protocol. The patients were asked regarding their preferred position for sciatic nerve block on the same day.

Primary outcome was patient's preferred position during sciatic nerve block.

Secondary outcomes included time to complete the block (from the time to cleaning the block site to the time when the

block needle is removed from the patient), the need for rescue analgesia intra-operatively after regional anaesthesia was performed and any complications.

The data was analysed using SPSS version 26.0 statistic software package. Categorical data were analysed using Chi-squared test, continuous data were analysed using t-test.

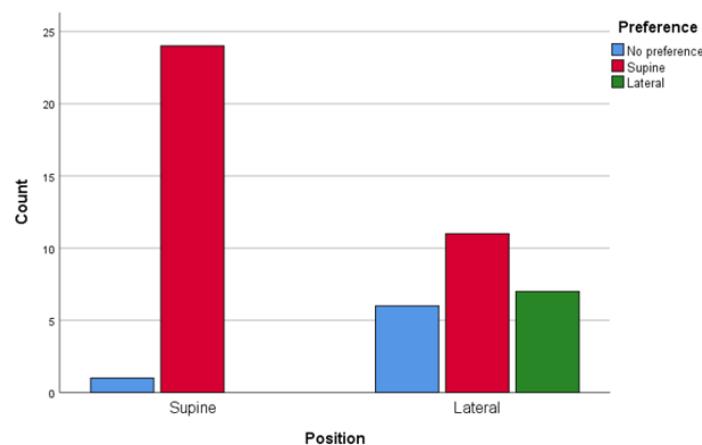
Results

96% of patients in supine group preferred to have their block performed in supine position (**Fig.1**). 45.8% of patients preferred the supine position even if they had received their block in lateral position (**table 1**).

There was no significant difference between the two arms for secondary outcomes (**table 2**). There was no significant difference in patients' demographics between the two arms of the study (**table 3**).

One patient in the lateral group was lost to follow up and therefore not included in the analysis. The patient was uncontactable after being discharged on the day of surgery.

Fig. 1: Patient's preferred positioning for sciatic nerve block according to the position their sciatic nerve block was performed in



Discussion

All but one of the patients in the supine group preferred to be in supine position during sciatic nerve block with significant difference of p value <0.001. Most patients cited the reason of it being the most convenient and comfortable and they did not have to change position which may cause them pain.

More patients in the lateral group preferred to be in the supine position than being in the lateral position (45.8% vs 29.2%) although this is not significantly different (p 0.417). For

patients who preferred sciatic nerve block to be performed in lateral position, they reported that they were comfortable in lateral position as there was less pressure on the injured lower limb and they could flex both their knees during sciatic nerve block in lateral position. For patients who had no preference, many reported that they had no difficulty in changing position therefore having no preference for the position that sciatic nerve block was conducted in.



Table 1: Patient's preferred positioning for sciatic nerve block

Position	Supine	Count	Preference			Total
			No preference	Supine	Lateral	
			1	24	0	25
		% within Position	4.0%	96.0%	0.0%	100.0%
		% within Preference	14.3%	68.6%	0.0%	51.0%
		% of Total	2.0%	49.0%	0.0%	51.0%
	Lateral	Count	6	11	7	24
	Lateral	% within Position	25.0%	45.8%	29.2%	100.0%
	Lateral	% within Preference	85.7%	31.4%	100.0%	49.0%
	Lateral	% of Total	12.2%	22.4%	14.3%	49.0%
Total		Count	7	35	7	49
Total		% within Position	14.3%	71.4%	14.3%	100.0%
Total		% within Preference	100.0%	100.0%	100.0%	100.0%
Total		% of Total	14.3%	71.4%	14.3%	100.0%

P value of patient who had supine position and preferred supine position <0.001.

P value of patient who had lateral position and preferred supine position is 0.417.

Table 2: Secondary Outcomes between supine and lateral group

	Supine	Lateral	Significance
Average time taken for block (mins)	7.64	8.04	0.041
Rescue analgesia required (yes)	2 (8%)	3 (12.5%)	0.308
Complications	0	0	

Table 3: Patients' demographics in supine group versus lateral group

	Supine	Lateral	Significance value
Mean age (years)	65	63	0.817
Gender (Female)	19 (76%)	17 (70%)	0.426
Gender (Male)	6 (24%)	7 (30%)	
ASA			0.571
1	1	0	
2	5	5	
3	18	19	
4	1	0	
BMI <30	21 (88%)	17 (71%)	0.124
BMI >30	3 (22%)	7 (29%)	

While literature reports that medial approach to the sciatic nerve block is considered an advanced level block as the nerve is deeper and more challenging to perform [5-7], our study showed that there is no significant difference in the time

taken for completion of block, need for rescue analgesia and complication rates in both groups. Therefore, performing sciatic nerve block via the medial approach using our proposed position in supine position is non-inferior to the



lateral approach.

The limitation of this study is that the patients with BMI >30 in both groups is relatively fewer than BMI <30, which might account for the finding of no significant difference in time taken for block complication and complication rates as obese patients are likely to need more time for sciatic nerve block done in supine which is a deeper block, resulting in possibly higher complication rates.

Conclusion

Remaining in the supine position in our proposed novel convenient position for sciatic nerve block is the preferred position for most patient as it increases patient's comfort and it is non-inferior to performing sciatic nerve block in lateral position in terms of safety, efficacy and efficiency profile.

Acknowledgments

There are no competing interests to declare.

Raw data collected for this study are not publicly available to preserve individuals' privacy under European General data protection regulation.

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