World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Place of the Echoguide cervical block in carotid endarterectomy

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World Journal of Advanced Research and Reviews, 2025, 26(03), 729-732

Publication history: Received on 28 April 2025; revised on 31 May 2025; accepted on 03 June 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.26.3.2210

Abstract

Carotid endarterectomy is a well-established procedure for the secondary prevention of stroke. While general anaesthesia (GA) has traditionally been the standard approach, ultrasound-guided locoregional anaesthesia (LRA) has gained popularity due to advantages such as improved haemodynamic stability and real-time neurological monitoring. In our series, ultrasound-guided cervical plexus block was systematically employed, providing satisfactory anaesthetic comfort without the need for conversion to GA. These findings are consistent with existing literature, including the GALA trial, which highlighted the importance of individualised anaesthetic choice.

Ultrasound guidance enhances the safety and precision of cervical blocks by enabling direct visualisation of anatomical structures and optimising anaesthetic diffusion.

In our experience, the block was performed in an average of 10 minutes, with high surgeon satisfaction. Complications were rare and minor .Postoperative analgesia was generally effective with minimal opioid use.

Despite the study's limitations, our results support ultrasound-guided LRA as a safe and effective alternative to GA in carotid endarterectomy.

Keywords: Ultrasound guidance; Carotid endarterectomy; Cervical block; Local anesthesia

1. Introduction

The ageing of the population and the progression of atheromatous pathologies have increased the need for carotid endarterectomy. This procedure is often performed on patients with cardiovascular co- morbidities. Although general anaesthesia remains a well-controlled technique, it can lead to haemodynamic instability and complicate intraoperative neurological monitoring.

Regional anaesthesia, particularly cervical block anaesthesia, provides greater stability and direct clinical monitoring. Ultrasound guidance, by visualising structures and anaesthetic diffusion in real time, improves safety and precision [2]

2. Material and methods

Prospective study conducted at the Hassan II University Hospital in Fez between January 2014 and July 2021, including patients undergoing carotid endarterectomy under echo-guided cervical block. Angioplasty cases were excluded.

The analysis covered surgical indications, anaesthetic technique, intraoperative incidents, conversions to general anaesthesia, early complications, and patient and surgeon satisfaction.

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3. Results

The study included 30 patients who underwent carotid endarterectomy under locoregional anaesthesia using echo-guided cervical block. The mean age of the patients was 68.7 ± 7.9 years, with a male predominance (65.5%, 19 men). Twenty-three patients (76 Of these, 19 had suffered an ischaemic stroke and 4 a transient ischaemic attack. The remaining seven patients (24%) were asymptomatic, but had significant carotid stenosis with a high risk of progression.

The stenosis was located on the right in 62% of cases and bilateral in 75.8%. The mean time from diagnosis to surgery was 23 days. All patients underwent a block of the intermediate cervical plexus under ultrasound guidance, and in 65.5% of cases (n=19) a superficial block was associated. The average time taken to perform the block was 10 minutes, with an average delay of 37 minutes between anaesthesia and surgical incision.

With regard to intraoperative monitoring, all patients were monitored by invasive arterial pressure monitoring via an arterial line (radial or femoral). Intraoperative neurological assessment, based on clinical monitoring, led to the early detection of cerebral ischaemia in a single patient, necessitating the placement of a temporary shunt.

Incidents related to the anaesthetic technique were rare and not serious. Transient dysphonia was noted in 30% of patients, accidental interscalene block with transient upper limb paralysis in one patient (3.4%), and one case of isolated vagal bradycardia, corrected with atropine. No cases of systemic toxicity of the local anaesthetic have been reported. No definitive conversion to general anaesthesia was necessary.

Postoperatively, all patients were admitted to intensive care for close monitoring, with an average length of stay of 1.5 days. No major neurological or cardiovascular complications were observed. Postoperative hypertension was observed in 60% of patients, requiring transient pharmacological management. Post-operative analgesia was satisfactory in the majority of patients, with limited use of morphine (28%). The average hospital stay was 4 days.

Surgeons' satisfaction with the quality of the operating theatre was excellent or good in all cases. All patients were able to undergo surgery under optimum conditions, without any discomfort linked to anaesthesia.

Table 1 Results of our study

Parameter	**Results**
Total number of patients	30
Average age (± standard deviation)	68.7 ± 7.9 years
Symptomatic patients	76 % (n = 23)
High-risk asymptomatic patients	24 % (n = 7)
Right carotid stenosis	62 %
Bilateral carotid stenosis	75,8 %
Average time between diagnosis and surgery	23 days
Intermediate cervical block	100% of patients
Associated superficial cervical block	65,5 % (n = 19)
Average block completion time	10 minutes
Average time to surgical incision	37 minutes
Conversion to general anaesthesia	0 %
Transient dysphonia	30 % (n = 10)
Accidental interscalene block	1 case (3.4%)
Corrected vagal bradycardia	1 case (3.4%)
Use of intraoperative shunts	1 case (3.4%)
Post-operative stroke or MI	0 %

Post-operative hypertension	60 % (n = 18)
Sufficient non-morphine analgesia	72 % (n = 21)
Average length of stay in intensive care	1.5 days
Average length of hospital stay	4 days
Surgeon and patient satisfaction	Excellent to good in 100% of cases

4. Discussion

Carotid endarterectomy is a standard procedure for the secondary prevention of stroke[3]. While general anaesthesia has historically been the most widely used technique, locoregional anaesthesia, particularly under ultrasound guidance, has gradually gained in popularity due to its advantages in terms of haemodynamic stability and real-time intraoperative neurological monitoring [4,5].

In our series, the systematic use of an ultrasound-guided cervical plexus block ensured satisfactory anaesthetic comfort without conversion to general anaesthesia. These results confirm the data in the literature, in particular the GALA study[1], which compared the two techniques without concluding that there was a clear superiority, but stressed the importance of individualised assessment of the choice of anaesthetic.

Ultrasound guidance represents a major contribution to the performance of the cervical block, allowing direct visualisation of anatomical structures, a reduction in the risk of vascular or nerve puncture, and better diffusion of the local anaesthetic[2]. This approach was successfully applied in our study, with the average time taken to perform the block being 10 minutes, and all the surgeons judging its effectiveness to be excellent. Complications related to locoregional anaesthesia were rare and benign, with the exception of an accidental interscalene block resulting in transient paralysis of the upper limb, with no long-term functional consequences. These observations are in line with those of other studies, which report a rate of minor complications of less than 5% in current practice. One of the major advantages of echo-guided cervical block is the possibility of keeping a patient awake and cooperative, which allows direct neurological monitoring during carotid clamping. This continuous assessment is invaluable for detecting intraoperative cerebral hypoperfusion. In our study, only one patient showed signs of intolerance to clamping, justifying the placement of a shunt. This isolated event demonstrates the relevance of clinical monitoring in the context of locoregional anaesthesia.

4.1. Post-operatively, no cerebrovascular accident or cardiovascular event was reported.

No major adverse events have been reported. The frequent occurrence of increased blood pressure in Immediate post-operative pain (60% of cases) is well known and probably related to baroreflex denervation secondary to surgery. It was effectively managed with drug titration. Post-operative analgesia was generally satisfactory, with limited use of morphine, further illustrating the value of this technique in the multimodal management of high-risk patients.

The results of this study, although encouraging, must be interpreted with caution due to the small sample size and single-centre nature of the study. However, the consistency of the results and the absence of major complications support the use of ultrasound-guided locoregional anaesthesia as a safe and effective alternative to general anaesthesia for carotid endarterectomy

5. Conclusion

Ultrasound-guided locoregional anaesthesia is a safe and effective alternative to general anaesthesia for carotid endarterectomy. It offers reliable neurological monitoring, reduced cardiovascular risks and a high degree of operative satisfaction.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine and Pharmacy, Sidi Mohammed Ben Abdellah University, Fez, Morocco. Given the retrospective nature of the study and the use of anonymised data, the requirement for informed consent was waived by the committee. Statement of informed consent

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