Journal of Aafiyah Health Research (JAHR) 2025. Vol. 6, No. 1. Page 392-398
https://doi.org/10.52103/jahr.v6i1.2010
P-ISSN: 2722-4929, E-ISSN: 2722-4945

JOURNAL OF AAFIYAH HEALTH RESEARCH (JAHR)

Publisher: *Postgraduate Program, Universitas Muslim Indonesia*
Journal Homepage:
http://pascaumi.ac.id/index.php/jahr/index

Original Article

A Critical Appraisal of Global Guidelines on Obturator Nerve Block in TURP: Urological and Anesthetic Collaboration

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Article History
Received: 13 January 2025
Revised: 24 January 2025
Accepted: 31 January 2025

Keywords: Anesthesia; Obturator Nerve Block; Patient Safety; Transurethral Resection of the Prostate

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ABSTRACT
Background: Obturator nerve block (ONB) is increasingly recognized as a crucial component in transurethral resection of the prostate (TURP) to prevent complications such as the obturator reflex, which can lead to intraoperative risks including bladder perforation. While ONB has been incorporated into various global clinical guidelines, its implementation remains inconsistent.
Objective: This study critically examines the role of ONB in TURP by analyzing global guidelines, comparing different ONB techniques, and evaluating the integration of ONB with other surgical modalities to improve patient safety and procedural outcomes.
Method: A comprehensive review of literature and clinical guidelines was conducted to assess the effectiveness, safety, and best practices related to ONB in TURP. Key parameters examined include the efficacy of ultrasound-guided ONB, multimodal approaches combining ONB with bipolar energy or laser techniques, and the impact of training programs for anesthesiologists.
Results: Global guidelines from major urological and anesthesiology associations recommend ONB as a beneficial but non-mandatory procedure in TURP, particularly for high-risk patients. Evidence suggests that ultrasound-guided ONB improves procedural success rates and reduces complications. The combination of ONB with newer surgical modalities offers enhanced safety, and structured training programs can further facilitate its adoption in clinical practice.
Conclusion: Although ONB is not universally required for TURP, its application significantly improves intraoperative safety. Standardizing protocols, expanding training programs, and integrating ONB with advanced surgical techniques can enhance the efficacy and reliability of TURP globally. Future research should focus on long-term outcomes and cost-effectiveness to refine clinical recommendations.

BACKGROUND

The transurethral resection of the prostate (TURP) is the primary procedure for managing benign prostatic hyperplasia (BPH) that causes urinary tract obstruction. This procedure remains the gold standard due to its effectiveness in relieving obstructive symptoms with relatively lower complications compared to open surgery [1]. However, TURP carries several intraoperative risks, one of which is the obturator reflex, which can lead to

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involuntary contraction of the thigh adductor muscles due to obturator nerve stimulation during resection, thereby increasing the risk of complications such as bladder perforation and bleeding [2].

Obturator nerve block (ONB) has been proposed as an adjunct anesthesia method to prevent the obturator reflex during TURP. This technique involves injecting a local anesthetic around the obturator nerve to inhibit nerve impulse transmission that triggers muscle contraction [3]. The use of ONB in TURP has been extensively studied and has shown significant effectiveness in reducing the incidence of the obturator reflex, particularly in patients with prominent lateral prostatic lobes or bladders adjacent to the obturator nerve [4].

However, the implementation of ONB in TURP varies across different countries. Several global urological organizations, such as the European Association of Urology (EAU) and the American Urological Association (AUA), provide differing recommendations regarding ONB in this procedure [5,6]. While some guidelines emphasize the importance of ONB as part of the anesthesia protocol in TURP, others offer more flexibility, relying on clinicians' judgment based on individual patient risk factors [7].

In clinical practice, the role of anesthesiologists is crucial in ensuring ONB effectiveness. The American Society of Anesthesiologists (ASA) states that ONB should be considered, particularly for patients at high risk of experiencing the obturator reflex [8]. However, challenges in ONB implementation include variations in techniques used, the requirement for specialized skills in nerve blockade, and the availability of adequate equipment such as ultrasound to enhance blockade accuracy [9].

ONB techniques themselves have several variations, including the classical approach with anatomical palpation and more modern techniques using ultrasound guidance or a nerve stimulator. Recent studies indicate that ultrasound use can improve blockade success rates and reduce complications such as hematoma or improper anesthetic spread [10]. Therefore, developing safer and more effective techniques remains a crucial topic in discussions regarding ONB implementation in TURP.

Despite substantial evidence supporting ONB effectiveness, some studies still report challenges such as varying blockade success rates, vascular injury risks, and rare yet significant local anesthetic side effects [4,6]. Additionally, institutional policy differences and resource availability influence the extent of ONB adoption across countries. Thus, a more systematic evaluation of existing global guidelines is needed to determine the extent to which ONB can be integrated as a standard in TURP.

This article aims to review global guidelines on ONB in TURP by highlighting recommendations from various urological and anesthesiological organizations and evaluating challenges in its clinical implementation. By understanding the differences in existing guidelines, an optimal strategy can be developed to enhance the safety and effectiveness of TURP for patients worldwide.

METHOD

This study employs a critical review approach to global guidelines on the use of obturator nerve block (ONB) in transurethral resection of the prostate (TURP). It analyzes and compares recommendations from various urological and anesthesiological organizations regarding the effectiveness, safety, and indications of ONB in preventing the obturator reflex during TURP. The review is conducted by examining guideline documents, scientific articles, and meta-analyses that discuss the clinical and technical aspects of ONB.

The collected data includes global clinical guidelines, observational studies, clinical trials, and meta-analyses published in international journals since 2015. A descriptive comparative analysis is performed to highlight key differences in the ONB protocols recommended across various guidelines. Additionally, an evaluation of ONB implementation methods—such as anatomy-based techniques, nerve stimulator guidance, and ultrasound guidance—is conducted to assess their effectiveness in reducing intraoperative complications during TURP.

Furthermore, this study identifies challenges in ONB implementation in clinical practice based on case reports and retrospective reviews. The review aims to provide evidence-based recommendations that enhance collaboration between urologists and anesthesiologists in TURP procedures. Through this approach, the study is expected to serve as a reference for developing more effective and safer standards for patients undergoing TURP.

RESULT

The use of obturator nerve block (ONB) in transurethral resection of the prostate (TURP) has been a subject of debate in various global guidelines. ONB aims to prevent the obturator reflex, which can cause

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involuntary contraction of the thigh adductor muscles, increasing the risk of intraoperative injuries such as bladder perforation and bleeding [7]. However, there are variations in the recommendations for ONB implementation across different guidelines, with some organizations advocating for its routine use, while others emphasize selective application based on the patient's clinical condition [8].

This section will discuss a comparison of global guidelines, the effectiveness of ONB in preventing the obturator reflex, challenges in implementing this technique in clinical practice, and recommendations for improving its application. The evaluation is based on data from various urological and anesthesiological organizations, as well as clinical studies and meta-analyses assessing the benefits and risks of ONB in TURP [9,10].

Comparison of Global Guidelines

An analysis of various global guidelines on the use of obturator nerve block (ONB) in transurethral resection of the prostate (TURP) reveals variations in its recommended implementation. Guidelines from the European Association of Urology (EAU) and the American Urological Association (AUA) highlight the importance of preventing the obturator reflex during TURP but do not mandate the universal use of ONB [7,8]. Both organizations recommend that ONB should be considered based on the patient's anatomy, medical history, and the expertise of the anesthesia team involved in the procedure.

The European Association of Urology (EAU) states in its guidelines that the obturator reflex can lead to serious complications, particularly in patients with significant lateral lobe hypertrophy of the prostate. Therefore, they suggest using ONB primarily in high-risk patients [11]. However, these guidelines do not explicitly state that ONB must be a mandatory standard in all TURP procedures; rather, its application depends on individual clinical considerations.

The American Urological Association (AUA) takes a slightly different approach, emphasizing that ONB use in TURP should be tailored to the patient's condition and the anesthesiologist's preference [8]. AUA focuses more on a multimodal approach to reducing the obturator reflex, including using bipolar energy or laser as alternatives to conventional resection, which can lower the risk of obturator nerve stimulation [12].

In addition to EAU and AUA, the Asian Pacific Prostate Society (APPS) also includes ONB in its recommendations for TURP, particularly for patients at high risk of the obturator reflex. APPS highlights that ultrasound-guided nerve block is preferable to the classic anatomy-based technique as it provides more consistent results in blocking obturator nerve impulses [13].

Anesthesiology organizations, such as the American Society of Regional Anesthesia and Pain Medicine (ASRA), also recognize the role of ONB in TURP. They recommend using ultrasound guidance to improve block success rates and reduce complications such as hematoma and unintended anesthetic spread [14]. Additionally, ASRA emphasizes the need for intensive training for anesthesiologists in ONB techniques to ensure wider and safer adoption in various healthcare centers. As shown in Table 1.

Table 1. Comparison of Global Guidelines on Obturator Nerve Block (ONB) in TURP

Organization	ONB Usage Recommendation	Main Indications	Recommended Technique	Additional Notes
European Association of Urology (EAU)	ONB is recommended for patients at high risk of obturator reflex	Patients with large prostates (>50 mL) or at-risk anatomy	Ultrasound or nerve stimulator	Not mandatory for all cases
American Urological Association (AUA)	ONB is optional, suggested in specific conditions	Patients with a history of TURP complications	Anatomical technique or ultrasound	Considered based on clinical evaluation
American Society of Anesthesiologists (ASA)	ONB is advised to reduce intraoperative injury risk	All TURP patients undergoing spinal anesthesia	Combination of ultrasound and nerve stimulator	Emphasizes the importance of operator skill
Canadian Urological Association (CUA)	ONB is not mandatory but beneficial in complex cases	Patients with very large prostates (>80 mL)	Combined techniques for optimal results	Should be performed by trained anesthesiologists

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P-ISSN: 2722-4929, E-ISSN: 2722-4945

Asian Pacific Prostate Society (APPS)	ONB is recommended as a standard in TURP	All TURP patients, especially those undergoing lateral resection	Ultrasound as the primary method	Prioritizes a technology-based approach

Effectiveness of ONB in Preventing the Obturator Reflex

Several clinical studies have demonstrated that ONB significantly reduces the incidence of the obturator reflex during TURP. A study by Cho et al. reported that ONB reduced the incidence of the obturator reflex by up to 70% compared to a group that did not receive this nerve block [4]. Additionally, research by Zhang et al. comparing the effectiveness of ultrasound-guided ONB and nerve stimulator-guided ONB found that ultrasound guidance yielded better outcomes in achieving precise and effective nerve blockade [5].

However, a study by Inoue et al. showed that the success rate of ONB can vary depending on the technique used and the operator's experience [6]. Their findings indicated that ultrasound-guided ONB had a higher success rate than traditional anatomy-based techniques. Consequently, global guidelines tend to favor ultrasound-assisted techniques to enhance the accuracy and effectiveness of ONB in TURP. As shown in Table 2.

Table 2. Comparative Analysis of ONB Techniques in TURP

Technique	Guidance Method	Effectiveness	Safety Profile	Clinical Application
Landmark-Based	Anatomical landmarks	Moderate	Higher risk of inaccurate placement	Used in settings with limited ultrasound access
Nerve Stimulator-Guided	Electrical stimulation	High	Lower risk compared to anatomical approach	Preferred for accurate nerve localization
Ultrasound-Guided	Real-time ultrasound imaging	Very High	Safest, precise needle placement	Standard of care in modern anesthesia
Combination (US + NS)	Ultrasound + nerve stimulator	Very High	Lowest risk, most precise	Recommended in complex or high-risk cases

Challenges and Limitations in ONB Implementation

Despite the benefits of ONB in TURP, several challenges hinder its widespread adoption. One of the main challenges is the need for specialized skills to perform the nerve block, especially using ultrasound guidance. Not all healthcare centers have the facilities or trained personnel for this technique, leading to variations in ONB adoption across different countries [9].

Additionally, ONB is associated with complication risks, including hematoma, unintended anesthetic spread, and vascular injury [6,10]. Therefore, some global guidelines recommend selective ONB use based on a risk-benefit assessment for each patient. As shown in Table 3.

A study by Lee et al. indicated that while ONB effectively reduces the obturator reflex, its associated complications must be carefully considered, particularly in patients with coagulation disorders or vulnerable vascular conditions [15]. Thus, proper patient selection is a crucial factor for the successful implementation of ONB in TURP.

Table 3. Incidence of ONB-Related Complications in TURP

Complication	Landmark-Based	Nerve Stimulator-Guided	Ultrasound-Guided	Combination (US + NS)
Incomplete Block	High	Moderate	Low	Very Low
Vascular Injury	Moderate	Low	Very Low	Very Low
Nerve Injury	High	Moderate	Low	Very Low
Hematoma	Moderate	Low	Very Low	Very Low
Local Anesthetic Toxicity	Low	Very Low	Very Low	Very Low

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P-ISSN: 2722-4929, E-ISSN: 2722-4945

Recommendations for Enhancing ONB Implementation in TURP

Based on the analysis of global guidelines and clinical studies, several steps can be taken to improve ONB implementation in TURP:

1. Enhanced training programs – Training anesthesiologists in ultrasound-guided obturator nerve block techniques can increase procedure success rates and reduce complications [5,9].
2. Development of evidence-based clinical protocols – Standardizing ONB integration into TURP can ensure broader and more consistent implementation in clinical practice.
3. Selective patient screening – Identifying patients at high risk for the obturator reflex can help optimize ONB use and minimize unnecessary interventions.
4. Adoption of multimodal approaches – Combining ONB with bipolar energy or laser techniques can further reduce the risk of nerve stimulation and improve TURP safety.

Considering data from various global guidelines, it can be concluded that while ONB is not a mandatory procedure in TURP, its use is highly recommended, particularly in high-risk patients. The implementation of safer and more effective techniques, along with broader medical training, can enhance the global safety and efficacy of TURP.

DISCUSSION

Obturator nerve block (ONB) has gained significant attention in transurethral resection of the prostate (TURP) due to its role in preventing intraoperative complications, particularly the obturator reflex, which can lead to severe patient safety risks. Several studies have demonstrated that the obturator reflex, a sudden contraction of the adductor muscles triggered by electrosurgical stimulation of the obturator nerve, can result in bladder perforation and compromised surgical outcomes [16,17].

Global clinical guidelines, including those from the American Urological Association (AUA) and the European Association of Urology (EAU), acknowledge the potential benefits of ONB, particularly in patients with a high risk of developing the obturator reflex [18,19]. The use of ultrasound-guided ONB has been widely recommended due to its superior precision compared to traditional landmark-based techniques, leading to a higher success rate and reduced complications [20,21].

A meta-analysis comparing different ONB techniques found that ultrasound-guided approaches significantly reduce failure rates and procedural time while improving postoperative pain control [22]. Additionally, some reports suggest that combining ONB with general or spinal anesthesia may enhance the overall safety of TURP by providing better intraoperative hemodynamic stability and minimizing the need for excessive anesthesia [23,24].

Despite these advantages, ONB is not universally performed during TURP. A major reason for this variation is the lack of standardized protocols across different healthcare systems. While some institutions mandate the use of ONB for all TURP cases involving monopolar electrocautery, others reserve its use only for selected high-risk patients [25]. Cost-effectiveness and the availability of trained anesthesiologists capable of performing ONB also play a crucial role in determining its routine application [26].

Further studies have suggested that multimodal approaches integrating ONB with newer surgical techniques, such as bipolar resection or laser enucleation, can mitigate the risks associated with the obturator reflex while maintaining procedural efficacy [27]. These modalities minimize nerve stimulation and reduce the reliance on ONB, potentially offering an alternative solution where ONB expertise is limited [28].

Training programs for anesthesiologists focusing on ONB techniques have been advocated to ensure wider adoption of this procedure. Educational initiatives emphasizing ultrasound guidance and the anatomical considerations of the obturator nerve can help bridge the gap in proficiency levels, ultimately leading to more consistent application of ONB in clinical settings [29,30].

Additionally, patient selection remains a key factor in optimizing ONB outcomes. Screening protocols aimed at identifying individuals with anatomical variations or increased susceptibility to the obturator reflex can improve the effectiveness of ONB while reducing unnecessary interventions [31,32].

In summary, while ONB presents a valuable tool in improving the safety profile of TURP, its implementation remains inconsistent globally. Efforts to develop standardized, evidence-based clinical guidelines and expand training opportunities can enhance its utilization. Future research should focus on comparative studies

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evaluating ONB's long-term benefits, cost-effectiveness, and integration with evolving surgical techniques to establish a more definitive role in TURP [33,34,35].

CONCLUSION

The implementation of obturator nerve block (ONB) in transurethral resection of the prostate (TURP) has demonstrated significant benefits in minimizing the risk of intraoperative complications, particularly the obturator reflex. Based on global guidelines and clinical studies, ONB is highly recommended for high-risk patients undergoing TURP, especially in cases involving monopolar electrocautery. The use of ultrasound guidance has been found to enhance the accuracy and safety of ONB, reducing the likelihood of nerve injury and procedural failure.

Furthermore, the integration of ONB into standardized clinical protocols can improve patient outcomes and procedural efficiency. Training programs aimed at anesthesiologists and urologists should emphasize the importance of this technique, ensuring proficiency in ultrasound-guided ONB and multimodal approaches. Selective patient screening should also be prioritized to identify individuals who would benefit most from ONB, thereby optimizing resource utilization and minimizing unnecessary interventions.

In conclusion, while ONB is not universally mandated in TURP, its strategic implementation can significantly enhance surgical safety and patient outcomes. Future research should focus on refining ONB techniques, exploring alternative nerve block approaches, and evaluating long-term patient benefits. Strengthening collaboration between anesthesiologists and urologists in ONB application will further contribute to the overall success of TURP procedures globally.

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