



Perioperative Care Advances in Ultrasound-Guided Transperineal Prostate Biopsy with Local Anesthesia

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Abstract: This study reviews nursing approaches for patients undergoing ultrasound-guided transperineal prostate biopsy under local anesthesia. It scrutinizes perioperative care, emphasizing patient care, anxiety mitigation, pain management, complication prevention, and post-discharge education. The goal is to establish an evidence-based protocol to enhance patient well-being and hospital experience.

Keywords: transperineal prostate biopsy; local anesthesia; perioperative; nursing; review

1. Introduction

Prostate cancer (PCa) is the second most common cancer and the incidence of PCa is on the rise annually (1). Prostate biopsy, serving as the gold standard for PCa diagnosis, varies in methodology with transperineal and transrectal approaches. However, Loeb's team (2) has identified an elevated risk of sepsis following transrectal Prostate Biopsy (TRB) a finding corroborated by other studies (3, 4). Recently, Transperineal Prostate Biopsy (TPB) under local anesthesia (LA) has become more prevalent, favored for its lower infection rates and cost-efficiency. Studies show that TPB reduces rectal injury and related complications significantly (5, 6). Sai Liu et al. (7, 8) found comparable cancer detection rates for TPB and TRB. The European Urological Association, in its 2020 guidelines, recommends TPB under LA as a superior option to TRB (9).

A specialized team proficient in cancer protocols and communication is crucial for managing patient care from pre-op to post-discharge (10, 11). Nursing research aims to prevent complications in ultrasound-guided TPB under LA, an area where perioperative care is advancing. This systematic review evaluates the literature, emphasizing psychological support, pain management, and complication prevention strategies. The objective is to develop an evidence-based protocol to optimize patient well-being and consultation effectiveness.

2. Preoperative Care

TPB is an invasive procedure that can cause patient distress (12). The level of postoperative pain can influence patient choices regarding anesthesia and their willingness to have future biopsies (13). Anxiety is common pre-biopsy, with 20% of patients reporting considerable pain that affects their well-being (14), showing that psychological factors greatly affect the perception of pain related to TPB. Preoperative psychological care aims to reduce anxiety, stress, and pain anticipation, which can decrease the perceived level of intraoperative pain (15). Anxiety is often due to concerns about outcomes and a lack of understanding of the procedure. Clear communication of medical information and the biopsy process can alleviate anxiety. Innovative approaches such as a pre-procedure brochure (16) and a virtual reality (VR) program (17, 18) have been used to improve patient knowledge and satisfaction by illustrating the biopsy process.

3. Intraoperative Care

The growing prevalence of TPB demands effective pain management strategies, as it is often more painful than TRB (7, 8). Studies indicate that TPB under LA results in moderate pain, with older patients less sensitive to it and higher anxiety increasing pain perception (19). The most painful moment is the injection of LA (6, 20). Therefore, improving pain management is crucial for nursing. Music therapy has emerged as an economical way to ease anxiety and pain (21). Rena et al. (22) showed that music during procedures like prostate biopsies enhances patient experience by reducing anxiety and pain and increasing satisfaction. A recent clinical trial confirmed that both VR and stress ball interventions were effective in alleviating intraoperative pain and anxiety (23). A study based on social support theory (24) demonstrated that hand-holding,

regardless of the relationship, can notably diminish the emotional distress of TPB. Wu et al. (25) enhanced this by elucidating the biopsy process and providing real-time ultrasound imaging, which bolstered patient cooperation.

4. Postoperative Care

Bleeding is a common post-biopsy complication, with gross hematuria affecting 10-14% of patients (26). Compression methods to prevent bleeding differ; Zhou Qiuying et al. (27) suggest 6 hours with a sandbag. Meng et al. (28) confirm the effectiveness of immediate 30-minute compression. Perineal hematomas, indicated by swelling and pain, are classified by Zeng Yan et al. (10) into mild, moderate, and severe based on size; moderate cases may be treated with ethanol compresses, while severe cases require immediate medical assessment for potential surgery.

5. Conclusion

TPB demands a coordinated, multidisciplinary strategy. Effective team collaboration can minimize patient wait times and boost satisfaction, which may promote patient willingness to repeat the procedure. Standardized perioperative care is essential for patient safety, anxiety reduction, and pain management. Interventions targeting preoperative anxiety and intraoperative pain are vital for optimizing patient outcomes. Preoperative education, particularly with knowledge visualization and technologies like VR or video lectures, warrants exploration in future studies. The effectiveness of intraoperative pain management also requires more rigorous, controlled trials.

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