

## Evaluating the Role of Sentinel Lymph Node Biopsy in Minimally Invasive Cancer Surgery

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### Abstract

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**Keywords:** Cancer surgery; General malignancy; Lymph node metastasis

Minimally invasive surgery (MIS) has transformed the landscape of surgical care for the past few decades, offering patients the promise of faster recovery times and improved postoperative quality of life. The introduction of laparoscopic and robotic-assisted techniques has expanded the range of malignancies in which minimally invasive general surgery is applicable, including melanoma and colorectal cancer [1]. While MIS has undoubtedly revolutionized cancer treatment, ensuring the accuracy of lymph node staging remains a paramount concern for oncologists and surgeons alike. The advent of the sentinel lymph node biopsy (SLNB), a technique first introduced in the 1990s, has emerged as a pivotal tool in the evaluation of lymphatic spread. SLNB is a minimally invasive procedure that identifies and samples the sentinel lymph node (SLN), the first lymph node in the lymphatic drainage pathway. By performing SLNB, surgeons can determine the likelihood of lymph node metastasis, which is critical for determining the extent of lymph node dissection and the need for adjuvant therapy. In addition, SLNB reduces the risk of unnecessary lymph node dissection, thereby minimizing the potential for associated complications [2, 3].

The integration of SLNB into minimally invasive cancer surgery represents a significant milestone in the evolution of cancer management. It bridges the gap between the benefits of minimally invasive techniques and the imperative for accurate staging. However, to maximize its potential, it is essential to comprehend the role of SLNB in the context of minimally invasive procedures and its relationship to clinical outcomes. This review aims to explore the current literature on SLNB in minimally invasive cancer surgery, examining its role in preoperative staging, its impact on surgical planning, and its contribution to patient outcomes. Furthermore, we will discuss the challenges associated with integrating SLNB into minimally invasive techniques, including the need for standardized protocols and the importance of multidisciplinary collaboration.

the impact of SLNB on patient outcomes and the learning curve associated with this procedure. Additionally, we will explore emerging technologies and innovations that may enhance the accuracy and applicability of SLNB in minimally invasive surgery [5].

Ultimately, this review aims to provide a comprehensive overview of the role of SLNB in minimally invasive cancer surgery, highlighting its strengths and limitations. We will discuss the current evidence supporting the use of SLNB and explore the challenges and future directions of this technique. By understanding the role of SLNB in minimally invasive cancer surgery, surgeons and oncologists can make informed decisions regarding patient care and improve clinical outcomes. The integration of SLNB into minimally invasive cancer surgery represents a significant milestone in the evolution of cancer management, and this review aims to explore the current evidence supporting its use and the challenges associated with its implementation. We will discuss the role of SLNB in preoperative staging, its impact on surgical planning, and its contribution to patient outcomes. Furthermore, we will discuss the challenges associated with integrating SLNB into minimally invasive techniques, including the need for standardized protocols and the importance of multidisciplinary collaboration.

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