



Clinical Commentary

When surgical innovation and payment systems collide: The sentinel lymph node story



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In recent decades, gynecologic oncologists have witnessed significant surgical innovation, such as fertility-sparing operations for cervical cancer, advancements in ultra-radical pelvic and abdominal operations, and sentinel lymph node (SLN) mapping for uterine and cervical cancer. Yet our payment systems have not kept up. The Current Procedural Terminology (CPT) codes used to guide reimbursement lag surgical innovation, and many of our now-routine surgical procedures such as fertility-sparing radical trachelectomy do not have specific CPT codes. The problem is most pronounced in the advancement of SLN mapping for staging of endometrial cancer, the most common gynecologic malignancy. Through our institution's experience with developing the SLN mapping algorithm and making this technique standard of care at our hospital and others, we have observed that lagging reimbursement structures are disincentivizing the adoption of surgical innovations that improve the value of care we offer to patients. The time has come for payment systems to catch up to innovation.

1. The innovation of SLN mapping in endometrial cancer care

The initial surgical staging of women diagnosed with endometrial cancer has historically included complete pelvic and sometimes paraaortic lymphadenectomy, with an attributable 20% risk of lower extremity lymphedema [1]. Seven years have passed since our institution first developed and published on the importance of applying a pelvic SLN algorithm for the staging of apparent uterine-confined endometrial cancer. Experience has shown that applying the SLN algorithm in lieu of complete lymphadenectomy provides valuable staging information in the majority of patients and may decrease morbidity associated with lower extremity lymphedema [2,3]. Moreover, SLN mapping provides useful oncologic information regarding tumor metastasis that may

alter adjuvant therapy and outcomes. These data and similar research from other institutions led to the incorporation of the SLN algorithm into the 2014 National Comprehensive Cancer Network (NCCN) guidelines as an option for the surgical staging of women with endometrial cancer [4].

The value of applying this surgical innovation to patients with endometrial cancer has been underscored by data showing increased adoption as well as decreased length of stay and costs associated with minimally invasive SLN biopsy compared to full lymphadenectomy [5]. In a recent decision analysis comparing three lymphadenectomy strategies, SLN mapping showed the lowest costs and highest quality-adjusted survival, making it the most cost-effective strategy for women with “low-risk” endometrial carcinoma [6].

With the potential benefits of this surgical innovation for both patients and the broader healthcare system, one would expect rapid adoption across the country. However, a study utilizing a nationwide database showed that in 2015, only 10% of women with endometrial cancer who underwent surgical staging had an SLN biopsy performed [5].

2. The impact of SLN adoption on different stakeholders

Assessing the impact of SLN algorithm adoption on multiple stakeholders provides important context for why adoption may be compromised by lags in reimbursement. From a patient perspective, applying the SLN algorithm is a win across the board. Not only do the majority of patients have enhanced surgical staging—and therefore more appropriate adjuvant therapy—they also have the opportunity to withhold adjuvant therapy if surgical staging results are reassuring. Similarly, for managed care institutions and the greater healthcare system, lower costs and fewer complications also represent a resounding win. On the other hand, for provider institutions—and specifically surgeons—the ability to offer SLN mapping to patients requires (1) hefty upfront investment in technology, such as the robotic or laparoscopic platforms or additional intraoperative near-infrared imaging equipment; (2) dye for each procedure; and (3) investment of time for adequate surgical training. Pelvic SLN mapping is not a less technically demanding operation. SLN mapping requires meticulous retroperitoneal dissection, including the careful development of the anatomic pelvic spaces to allow for the precise localization of the lymphatic trunks that lead to the sentinel nodes. For surgeons, after incurring such costs and additional training, in lieu of submitting for the comparatively higher reimbursement assigned to full lymphadenectomy, surgeons face lower reimbursement tied to a simple lymph node sampling and often no reimbursement for the dye.

3. The current state of reimbursement for surgical innovation

Before critiquing the system for reimbursement of new surgical technologies, it is important to define the process through which new reimbursement codes are generated. CPT was first developed in 1966 by the American Medical Association (AMA) and arose as a means to classify medical procedures for purposes of recordkeeping, insurance claims, and statistical analysis. CPT was adopted in 1983 by the Centers for Medicare & Medicaid Services (CMS) as part of the then-current Healthcare Common Procedure Coding System. There are three distinct categories of CPT codes. "Category I" codes represent distinct procedures or services that are clinically recognized and generally accepted. "Category II" codes are simply performance measurement codes used to track quality of care data. "Category III" codes—not established until 2001—are temporary 5-year codes assigned to new and emerging technologies and procedures. Category III codes are used to collect data in order to justify establishing a permanent Category I CPT code. Though the existence or lack of a CPT code in a specific category was never intended to influence reimbursement, often Category III codes are not reimbursed until they reach Category I status, a process that can take up to 5 years.

For SLN mapping in endometrial cancer, unlike for breast and melanoma, no Category III codes have been created. Rather, the CPT coding system remains unchanged since before SLN mapping was implemented in practice. Surgeons who previously performed pelvic and aortic nodal lymphadenectomy who have adopted the SLN method currently bill for the lower relative value unit-generating retroperitoneal lymph node sampling as well as injection of the cervix, which is presently not reimbursable for endometrial cancer cases in the Medicare system.

4. Future of payment systems for value-based surgical innovation

We have seen the under-reimbursement of value-generating surgical innovation before. In an early study assessing the Medicare reimbursement system for breast cancer surgery, the authors found that innovative, less-invasive procedures were reimbursed at lower rates despite improved outcomes and fewer complications [7]. It is possible that insurers may not have enough infrastructure to catch up with the application of medical innovation and that no single employer has enough cancer patients to justify efforts to champion these much-needed reimbursement system updates. Nevertheless, healthcare subsystems that use the total number of pelvic lymph nodes to assign surgical effort and fee schedule are obsolete and need reform. The quality of surgical staging for apparent uterine-confined endometrial cancer should no longer be measured by the total number of pelvic lymph nodes removed but by the quality of the nodal assessment based on surgical precision and a bilateral SLN detection.

In an era marked by commitment to value-based initiatives and continued medical innovation, it is counterintuitive to continue to accept reimbursement models that lag surgical innovation. While surgeons will continue to do what is best for patients, financial disincentives

cannot help but pose unnecessary barriers to the rapid adoption of innovations that improve the lives of patients undergoing cancer surgery. We hope this commentary invites more clinical voices to join future efforts to better align reimbursement and evidence-based surgical innovation in gynecological oncology and other procedural specialties.

Conflicts of interest disclosures

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Author contributions

Dr. Abu-Rustum and Dr. Aviki contributed to idea conception and manuscript writing for this paper.

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