



Preoperative vulnerability assessment of the older thoracic surgical patient

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Abstract: The number of older adults, 75 years and older, undergoing surgery has expanded as the older population in the United States has grown. Thus, the larger number of older adults presenting for thoracic surgery will increase. The traditional measurements of mortality and morbidity for the older surgical patients are being replaced by quality of life. A less-invasive procedure, such as a video-assisted thoracic surgery (VATS), may meet the needs of the older thoracic surgical patient. A preoperative assessment of the older patient's health status and consideration of their vulnerabilities provide unique information that may influence surgical outcomes. The American College of Surgeons (ACS) along with The John A. Hartford Foundation developed the Geriatric Surgery Verification (GSV) program. This new quality program has 30 standards to guide hospitals in creating a program to improve care of the older surgical patient. Of particular importance is screening for geriatric vulnerabilities in the preoperative work-up to identify those vulnerabilities that may be modified, affect surgical outcomes, or assist in decision making for the surgeon as well as the patient. The geriatric vulnerabilities include age 85 and older along with cognition, risk of postoperative delirium, function, mobility, nutrition, swallowing difficulty, and palliative care assessment. This article presents a review of the recommendations from the ACS GSV *Optimal Resources for Geriatric Surgery 2019 Standards* for preoperative assessment by selecting validated and easy-to-use standard tools to assess geriatric vulnerabilities. It is important that the older thoracic surgical patient considering VATS benefit from a robust preoperative assessment along with review from a multidisciplinary health care team and collaborative decision-making to ensure an optimal surgical outcome.

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Introduction

The traditional measurements of quality care for older surgical patients have been mortality and morbidity. However, quality of life has become of greater importance to these patients. The older patient may be concerned about the effect of an operation on their quality of life, which includes psychosocial and physical well-being. An older patient's satisfaction with care and preferences for a less invasive procedure now is an essential consideration. Video-assisted thoracic surgery (VATS) is a less invasive procedure of major importance for the older thoracic surgical patient.

To assist the thoracic surgeon in proposing VATS to an older surgical patient, a preoperative evaluation that assesses geriatric vulnerabilities is necessary.

An octogenarian, for example, may choose a VATS limited resection (wedge resection or segmentectomy) or even stereotactic body radiotherapy over VATS lobectomy, accepting slightly greater risk of local recurrence or decreased survival (1,2) to experience faster recovery. Bongiolatti *et al.* found that quality of life in octogenarians undergoing lobectomy, while equivalent to younger patients at one month, was worse in the early postoperative period, with greater risk of complications (3). Others have shown,

however, that with proper selection octogenarians can expect results equivalent to their younger counterparts (4). The key here is proper selection.

The Geriatric Surgery Verification (GSV) Program, a quality program funded by a grant from the John A. Hartford Foundation to the American College of Surgeons (ACS) in 2015, established standards and designed a verification program that reflects the design of the current ACS quality programs to promote safe and quality care (<https://www.facs.org/quality-programs/accreditation-and-verification/geriatric-surgery-verification/>).

The creation of 30 standards of the GSV Program was developed over 4 years with 50 plus stakeholders and two phases of visiting various types of hospitals. Expertise was garnered from the array of stakeholders and evidence from the literature. The rigorous, evidence-based standards were methodologically created by the ACS to address the critical aspects of geriatric surgical care aligning with the ACS framework of quality care.

The preoperative evaluation standards of the GSV Program reflect four areas that identify the essential elements of care for older surgical patients: what matters most to the patient, mobility, mentation, and medications, and all prominent assessments in the American College of Surgeons National Surgical Quality Improvement Program/American Geriatric Society (ACS NSQIP/AGS) best practice guidelines. The complete GSV Program standards, *Optimal Resources for Geriatric Surgery*, were released in July 2019 (5). This article reviews the required geriatric vulnerability screens put forth in the ACS *Optimal Resources for Geriatric Surgery 2019 Standards*.

Geriatric vulnerability screens

There are eight vulnerability screens recommended in the preoperative assessment of the elective, older surgical patient. Any positive screen identified may allow the patient to engage in prehabilitation, such as to improve nutrition or mobility and, at most, a comprehensive geriatric assessment may be necessary to address more significant findings that had not been previously recognized. In the older patient requiring urgent or emergent surgery and there is no time to perform the vulnerability screens, the recommendation is for information to be gathered from the family or caregiver and the screens to be conducted within 48 hours after surgery if the clinical situation will allow.

Incorporating these preoperative screens in the assessment of the older surgical patient for VATS not

only helps to identify those patients that may be at risk for complications but also helps guide interventions for best surgical outcomes.

Eighty-five years of age and older

Advanced age of surgical patients increases their risk of poor postoperative outcomes and even death (6). In particular, patients 85 years of age and older are at a greater risk for adverse outcomes after surgery (7). It has also been shown that this age group has a higher complication rate, is likely to need an intensive care unit (ICU) admission, and has prolonged hospitalization (8).

Cognition and decision-making

Assessing a person's cognitive abilities during the preoperative evaluation is essential to determining their decision-making ability. This is necessary for a patient to understand the risks and benefits of the proposed surgery (9). The older patient's ability to make medical decisions as well as to discuss treatment goals and choices is also necessary for informed consent (10).

Cognitive function should be determined preoperatively for baseline reference. The patient with preoperative cognitive impairment is more likely to have postoperative complications, require a longer hospital stay, may be discharged to a higher level of care, and have an increased risk for mortality (11,12). Suggested tools to assess cognitive ability include the Mini-Cog™, Mini Mental Status Exam and the Montreal Cognitive Assessment.

Risk of postoperative delirium

Delirium is a familiar complication in older surgical patients and is often linked to postoperative complications (13), longer hospitalizations (14), cognitive impairment (15), functional decline, poor recovery (16,17), institutionalization (18), higher hospital costs (19), and increased mortality (20).

Prevention, screening, and early treatment are most important in the management of postoperative delirium. Management of postoperative delirium involves identification of those patients at the highest risk for developing postoperative delirium, necessitates proactive measures to prevent delirium, and having an established plan to intervene (21,22).

Underlying cognitive impairment or dementia predisposes older patients to develop delirium after surgery;

therefore, knowing the patient's baseline cognitive status is important. A prior history of delirium is also a risk factor for the development of delirium postoperatively (23).

Other risk factors for delirium may be related to polypharmacy and the use of psychotropic medications, urinary incontinence or constipation, behavioral disorders such as untreated or uncontrolled pain, depression or alcohol use; disease related, metabolic or functional impairments that need to be identified preoperatively (24).

Functional capacity

Preoperative functional capacity is a good predictor of postoperative outcomes (25) and an independent risk factor for mortality after any major surgery (26). Determining if an older patient can complete these tasks independently is necessary not only in the preoperative assessment but also for proactive discharge planning. A number of screening tools have been developed to assess functional status in older persons. Simple tools to assess function in the older surgical patient include Activities of Daily Living (ADLs), Independent Activities of Daily Living (IADLs), Functional Independence Measure (FIM), the Minimum Data Set (MDS), and the MDS for Post-Acute Care (MDS-PAC).

Mobility

Ambulation is essential in the early postoperative period to maintain function and promote recovery (27). Evaluation of an older patient's mobility preoperatively is necessary to identify any gait and balance disturbances. A positive finding for either or both disorders may place the patient at an increased risk for falls postoperatively. Use of a mobility aid prior to surgery by a patient has also been associated with poor postoperative outcomes (28).

Mobility assessment tools can be used in conjunction with overall clinical evaluation to assess fall risks. The Timed Up and Go Test is one of the tools used in the preoperative assessment of the older patient. This tool measures the time it takes for a patient to stand up from an arm chair, walk 10 feet (3 meters), turn around, return to the chair and sit down again (29,30). The average of three measurements is used with a cutoff score of >12.0 seconds as the screening threshold value for increased fall risk (31). Fall interventions should be implemented during the older surgical patients' hospitalization for a time equal or longer than 12.0 seconds (32).

Nutrition screen

A risk factor for postoperative recovery is a patient's nutritional status (33). Malnutrition is common in older patients. Malnutrition is linked with poor surgical outcomes including postoperative complications, longer hospitalization, and decreased quality of life (34).

Two widely used, validated screen tools are useful in identifying malnourished surgical patients. The Malnutrition Universal Screening Tool (MUST) and the Mini Nutritional Assessment Short Form (MNA-SF) may be used to recognize the older surgical patient for malnutrition and to direct interventions (35).

Patients noted to have severe nutritional deficits should be evaluated by a dietician before surgery. To help improve the patient's nutritional status, preoperative nutritional support may be needed (36).

Swallowing difficulty

Dysphagia, difficulty swallowing food or liquid, is common in aging adults. It may also hinder nutrition, be a risk factor for dehydration and aspiration pneumonia (37,38).

Identifying older patients at risk for abnormal swallowing in the preoperative assessment is now recommended. If the swallowing screen is positive, the patient may need to be evaluated before surgery by a speech therapist. Anesthesia should be informed of any potential aspiration risk as well as to the health care team following the patient after surgery (39).

Many tests may be utilized to assess swallowing function. A simple, preoperative screen that can identify silent and overt aspiration in the older patient is the 3-ounce (90 cc) water swallow challenge (40).

Assessment for palliative care

The preoperative evaluation of the older VATS patient should include consideration for palliative care. Palliative care for surgical patients can improve outcomes, generate cost savings, and reduce ICU lengths of stay. The goal of the palliative care assessment is to identify the older, high-risk, surgical patient with the focus of increased attention on goals of care conversation, decision making and symptom management (41,42).

A simple but highly sensitive and specific screening instrument to discern the need for palliative care is the "Surprise Question". The question asked by the health care

practitioner of themselves is: “Would I be surprised if the patient were to die in the next 12 months, even if surgery is performed?” If the answer is “no”, the patient should be referred for a palliative care assessment. This tool has been validated in the surgical population (43).

A practical option for preoperative assessment

A more practical approach to the older VATS patient preoperative assessment may be to select standard assessment tools that cover multiple vulnerability screens that are validated and easy to use. The Edmonton Frail Scale is simple and straightforward, includes a clock draw and Timed Up and Go along with several questions related to geriatric vulnerabilities (44).

Another example of an easy-to-administer screening tool is the Sinai Abbreviated Geriatric Assessment (SAGE), a validated and simple tool for clinical use. This tool covers the domains of cognition, frailty and function. No special equipment is required, and scoring is easy (45).

Management plans for positive vulnerability screens

Ideally, if any positive vulnerability screens were detected in the elective, preoperative older VATS patient, the results of the information should be presented at an interdisciplinary conference to include, at least, surgery, anesthesia, nursing case management/care transitions/social work, and a health care provider with geriatric expertise. A management plan of the positive findings from screens should be discussed and documented. Plans may include a formal evaluation by neurology for impaired cognition, implementation of a postoperative delirium care plan, or for physical therapy after surgery.

Conclusions

Unique challenges and needs are presented by the older surgical patient undergoing VATS. The effects of aging can make the older patient more susceptible to postoperative complications and a prolonged recovery. It is important that this older population requires preoperative assessment and input from a multidisciplinary health care team and collaborative decision-making to ensure an optimal surgical outcome.

A preoperative assessment of the older patient being considered for VATS is a multidimensional evaluation

including review of comorbid conditions as well as screens for geriatric vulnerabilities to elicit relevant information for use before and after surgery. This unique and important preoperative vulnerability assessment not only helps to identify those older VATS patients that may be at risk for complications but also allows implementation of preventive measures or interventions for best VATS outcomes.

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