Use of a Sternal Support Harness to Reduce Sternal Complications: Clinicals and Testimonials

Major complications following thoracic surgery fall into two categories: respiratory complications and wound infections. Especially at risk are those patients with co-morbidities (i.e. diabetes, obesity, emphysema, COPD etc) as well as barrel-chested men & large breasted women. Median sternotomy complications occur in 0.5 to 5% of patients with 0.2 to 3% of patients developing mediastinitis (1). The use of a sternal support harness following sternotomy has been found to reduce the incidence of sternal complications:

“For sternal wound infections are a major cause of morbidity and mortality following cardiac surgery, and a problem all over the world, affecting up to 5% of patients undergoing this type of operation. The support vest reduces the number of reoperations needed due to instability and deep sternal wound infections as well as the length of stay in hospital and is therefore cost effective due to the reduction of major events” (2,3)

Respiratory Complications

The support, comfort and pain relief a sternum support harness offers the patients allows them to be more confident and aggressive with deep breathing, thus contributing to increased lung volume and a quicker recovery to pre-op respiratory levels.

Respiratory complications are a primary concern in the recovery of the post surgical patient. Deep breathing exercises with emphasis on sustained inspiration to total lung capacity has been constantly effective in inflating alveoli and preventing postoperative pulmonary complications (5,6). Preoperative instruction includes the practice of proper deep breathing and coughing manoeuvres (7). Unfortunately recovering thoracic surgical patients are frequently non-compliant during their respiratory therapy exercise because of pain or fear of pain. Aggressive coughing and deep breathing manoeuvres, which frequently initiate coughing, are important for purging the lungs of fluid and inflating the lungs to prevent atelectasis. These manoeuvres are initiated in the hospital and are a mandatory part of post discharge respiratory therapy, critical to full recovery.

“Over half our patients are released by the fifth post operative day and many by the fourth post operative day. I believe this is due in a large part to the fact that we have a device available which allows the patient to continue aggressive coughing and deep breathing at home, with much less discomfort”. David G. Ellerston, M.D. Thoracic and Cardio Surgery, Modesto CA

“SternShield has an immediate effect on reducing pain levels caused by coughing and moving” S. Prapas, Director of Cardiac Surgery, Henry Dunant Hospital, Athens

Sternal Wound Stability & Sternal Wound Complications

Use of a sternal support harness has been found to cut wound infection by 50% (2). The harness provides wound support and pain management; this in turn gives patients the confidence and independence to continue their respiratory therapy in the unsupervised post discharge setting. Providing patients with a sternum support harness enhances quality of care & cost containment & provides the best possible chance of a speedy, uncomplicated recovery.

The incidence of postoperative sternal wound complications such as sternal dehiscence, infection and sternal instability is reported as between 1 and 5% (1,8). Deep wound infection is the most severe of the possible sternal complications and is associated with prolonged hospitalisation, high
costs and high rates of morbidity and mortality (9-12). Sternal wound complications fall into three categories: 1) deep subcutaneous infection 2) sternal infection and 3) mediastinal infection with sternal dehiscence. Mediastinitis occurs as a result of sternal instability and dehiscence and is usually evident from six days to three weeks following surgery (14). Most patients are usually discharged by this time. The incidence of morbidity and death from sternal wound complications occurs in significant numbers of patients. Upwards of 2.3% of patients may suffer these complications with an associated mortality rate of 13% to 52% (16, 17,18). Sternal wound infection increases the length of hospitalisation more consistently than any other major complication (19) and significantly influences readmission (20).

The percussive expansion associated with coughing puts extreme stress on the sternal wound. Ambulating, getting into and out of bed or chairs, bowel movements and other normal activities also place strain on the sternotomy site. While patients experience this stress on their sternal wound as pain and the feeling that they are “coming apart” the clinical result may in fact be grave: dehiscence and mediastinal infection. Sternal stability is crucial in preventing these severe sternal wound complications. Prophylactic methods still being used to achieve sternal stability following a sternotomy involve the use of folded sheets, towels or a pillow with hand pressure to splint the incision (21). This method, while providing an inward pressure to the sternum, provides no encircling support to the rib cage and chest wall during coughing is unavailable to the patient when ambulating and provides no lateral support to stabilise the sternal wound. Without sternal support, the pain of the surgical wound is often extreme. For this reason patients often lack the confidence to continue with respiratory therapy exercises and coughing following discharge. The risk to these patients in the unsupervised, post discharge setting is two-fold: 1) the patient may be unaware or unable to diagnose a potential sternal wound complication and 2) due to pain considerations, patients often lack the confidence to continue their respiratory therapy exercises in the outpatient setting.

“We have found that in all cases the patients feeling of safety was more pronounced with the use of SternShield. In median sternotomy, it decreases post-operative pain, it helps the earlier mobilisation of the patient and the consolidation of the thoracic cage”. A. Krasas, Thoracic Surgeon, Hygeia Hospital, Athens

“The SternShield design provides a steady secure support of the sternum, allowing the patient to move & cough without restriction from pain. For the high risk patients SternShield has shown a significant effect on reducing mediastinitis”. A Chronidou, Cardiac Surgeon, Onassis Cardiac Surgery Centre, Athens

References

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