Effect of Massage on Pain Management for Thoracic Surgery Patients

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Background: **Integrative therapies such as massage have gained support as interventions that improve the overall patient experience during hospitalization. Thoracic surgery patients undergo long procedures and commonly have postoperative back, neck, and shoulder pain.**

Purpose: **Given the promising effects of massage therapy for alleviation of pain, we studied the effectiveness and feasibility of massage therapy delivered in the postoperative thoracic surgery setting.**

Methods: **Patients who received massage in the postoperative setting had pain scores evaluated pre and post massage on a rating scale of 0 to 10 (0 = no pain, 10 = worst possible pain).**

Results: **In total, 160 patients completed the pilot study and received massage therapy that was individualized. Patients receiving massage therapy had significantly decreased pain scores after massage ($p \leq .001$), and patients' comments were very favorable. Patients and staff were highly satisfied with having massage therapy available, and no major barriers to implementing massage therapy were identified.**

Conclusions: **Massage therapy may be an important additional pain management component of the healing experience for patients after thoracic surgery.**

KEYWORDS: Massage, thorax, surgery, pain

INTRODUCTION

A growing number of health care institutions are integrating complementary and alternative medicine (CAM) therapies into the routine care of patients. The 2007 American Hospital Association survey conducted by Health Forums indicated that 37.4% of hospitals surveyed were offering one or more CAM therapies.(1) Many of these CAM therapies specifically target pain and anxiety, and it is thus reasonable to hypothesize that such therapies might help address postoperative needs that are not fully managed by conventional approaches. Massage therapy, in particular, appears to be a reasonable CAM choice in the postoperative setting. In this same survey, massage was being offered by 40% of responding hospitals and was the most widely used modality in hospitals, predominately for the stress management, comfort, and pain relief for patients.(1)

Extensive evaluation of massage therapy has shown that it can effectively improve a number of outcomes.(2,3) These improved outcomes include reduced pain, anxiety, and lymphedema, as well as decreased muscle tension, heart rate, blood pressure, and galvanic skin response. Also observed is increased skin temperature and blood flow with increased plasma β-endorphins.(4-15) Other reported findings include improved sleep and patient–physician communication, along with reduced fatigue, nausea, and depression.(4-15)

Massage therapy effectiveness has been studied in various patient populations, including patients requiring hospitalization, patients in intensive care units, and hospice patients.(2,3,16-25) Other research has focused on massage in the context of specific illnesses or procedures, including patients with cancer, hospitalization after acute myocardial infarction, patients with dementia, preterm neonates, men with human immunodeficiency virus, patients undergoing abdominal surgery or bone marrow transplantation, and patients recovering after cardiac surgery or awaiting cardiac procedures.(2,3,11,26-31)

While several studies have identified the benefits of massage therapy in other fields of medicine, none have specifically evaluated the benefits for thoracic surgery patients. General thoracic surgery is a surgical subspecialty that provides care to patients with a wide spectrum of diseases and conditions. These vary from malignancies of the lungs, esophagus, mediastinum, and chest wall to benign conditions of these same anatomical areas. The surgical procedures encompass either resection-type procedures, such as pulmonary lobectomy or esophagectomy, or

reconstructive operations, such as bronchoplasty or antireflux procedures. Surgical approaches for these procedures also span the continuum from thoracotomies, laparotomies, and sternotomies with potential for significant pain, debility, and morbidity to the newer options of minimally invasive approaches that may lessen but do not completely eliminate these same concerns.

Pain experienced postthoracotomy is often associated with long-term pain if not managed effectively in the immediate postoperative period. Postoperative pain is multifactorial. Layers of muscles, nerves, and bone are cut or manipulated. Large-bore chest tubes are placed and left in place for days to drain fluid and air from the chest cavity, contributing to patient discomfort.

A number of strategies have been developed to help minimize pain and discomfort. For example, pain management for the postthoracotomy patient typically includes epidural analgesia and/or anesthetics for an average of 3 days. Additional narcotics are provided intravenously with patient-controlled administration. At Mayo Clinic, Rochester, Minnesota, the Inpatient Pain Service is an additional resource that provides consultative support in addressing complex pain needs. Finally, minimally invasive and muscle-sparing procedures have been developed to decrease complications including postprocedural pain.

Despite these excellent efforts and advances, many patients still experience pain or discomfort to some degree in the postoperative setting. Because of the positive research studies mentioned above, our thoracic surgery pain team hypothesized that adding massage therapy could potentially be of benefit for pain management in addition to the current pharmacological and conventional management. Therefore, we undertook this pilot study to evaluate the feasibility of incorporating massage therapy into a high-volume thoracic surgery practice and to evaluate the effect on patient-reported pain.

METHODS

This pilot study used a descriptive pre–post evaluation design using an institutional standard numeric pain rating scale from 0 to 10. Zero indicated no pain and 10 indicated the worst possible pain.[32] The pilot study took place from July 30, 2009 through February 26, 2010. During this time, nursing staff identified patients recovering from general thoracic surgery procedures for massage based on their reported levels of pain, anxiety, and length of hospital stay. The surgical procedures spanned the spectrum of general thoracic surgery practice, including pulmonary resections, esophageal resections, and reconstructions for both benign and malignant disease, as well as various pleural, chest wall, and mediastinal procedures. This also included both conventional open surgical approaches and minimally invasive thoracoscopic or laparoscopic approaches.

Those patients with higher levels of pain (>4), with anxiety and longer hospital stays (>3 days), were assigned the highest priority for massage therapy and placed on the massage therapist appointment list.[33] Of those patients on the appointment list, some were excluded because they were unavailable at the scheduled massage times or refused massage at that time. Documented reasons for refusal of massage included nausea, diarrhea, and patients feeling like they were in too much pain and did not want to be moved or touched at that time. Every effort was made to reschedule the patient for another day. The Inpatient Pain Service and respiratory therapists could also request that massage therapy be provided for specific patients. Often these were patients who had already been identified by nurses who would benefit from massage therapy.

Two massage therapists provided four massage sessions between 9:00 AM and 10:00 AM from Monday through Friday. This time was the only available time for the massage therapists who were seeing other patients in other units already. The nursing staff had prior knowledge of the schedule, and every attempt was made to ensure that the patients were available during this 1-hour period. The advantages of this schedule were that it coincided with the surgeons and pain team doing rounds with these patients. This allowed for communication and direct feedback between the massage therapists and the surgical/pain team. The disadvantage was that if the patient was unavailable to receive massage at this time due to tests or medical contraindications they would not get the massage that day. The number of sessions available limited the number of patients who could receive therapy and thus resulted in a convenience sampling of patients.

The massage therapist used the appointment list to consult with nursing staff and determine the patients who would receive treatment for that morning. Patients who were on the list but had received a massage the previous day often were not able to receive a second treatment. Each massage session consisted of a 1- to 5-minute assessment, including comfortable positioning of the patient, and 20 minutes of hands-on massage that focused on the areas of primary concern as indicated by the patient. Typically requested areas were the back, neck, and shoulders. Patients were positioned in a chair, in bed supine, or on one side with assistance from nursing staff when needed. Positioning depended on the patient's comfort level, mobility, and placement of tubes, lines, and equipment. If the patient's pain seemed to worsen during the massage, often changing the patient's position would help. If it didn't, the therapist altered what he or she was doing by changing the pressure, massage technique, or part of the body being worked on. Patients were clothed in hospital gowns, and areas of the patient's body

that were not being massaged were covered with a sheet or blankets.

There were no contraindications for patients to receive massage, but the therapist did not massage within 2 inches of any surgical wound. Depth and pressure of massage was light to moderate. The following techniques were used by the two therapists: Swedish, craniosacral, myofascial release, reflexology, and diaphragmatic breathing. The therapist focused on using and adjusting massage techniques to help the patient release tension and pain, increase relaxation, and promote deeper breathing. Massage techniques were selected by the therapist and tailored on the basis of the patient's symptoms, symptom location, medical status, and positioning tolerance. The therapist modified massage techniques to avoid bruising, to avoid a negative impact on low or high blood pressure and heart rate, and to not pull on the incision site. Therefore, the angle of the massage stroke, pace, and amount of pressure were administered carefully. Massage was provided to head, neck, shoulders, back, hands, or feet depending on patient preference. Supportive positioning was used at the end of each session to maintain the patient's level of relaxation.

Patient pain levels were gathered by the massage therapist pre and post treatment. Nursing staff also routinely documented pain scores. Patient pain measurements were documented in the electronic medical record.

The massages were provided by two certified massage therapists with knowledge of the care of patients after thoracic surgery. One of the therapists received certification as a registered massage therapist by a school in Toronto, Canada. The therapist had 5 years of experience owning her own massage therapy clinic and 1 year of volunteer massage experience in the hospital environment. The other massage therapist received her certification through a technical college in Minnesota. The therapist then incorporated massage into her current position in sports medicine physical therapy. Both therapists were already employed in the hospital as part of the Healing Enhancement inpatient team at Mayo Clinic, where they had provided massage therapy to cardiovascular patients for the preceding year and a half. The therapists also completed a hospital-based massage therapy course through a local university. Prior to giving massage to the thoracic patients they both met with the thoracic surgery nursing staff and pain team to gain knowledge of the special requirements of this patient population. One of the therapists undertook a period of observation of thoracic surgery procedures in the operating room to gain an understanding of patient positioning during surgery.

The patients included in this study had authorized use of their medical record for retrospective review and research. This study was approved by the institutional review board. Pre and post treatment pain scale changes were analyzed using a two-tailed paired *t* test completed on data for all 160 patients. Nursing leaders obtained therapist-recorded, patient-specific comments related to the massage and staff feedback through discussions at the unit's pain team meetings.

RESULTS

This pilot study included a convenience sample of 194 patients. Patients who had not given research authorization and those who could not give pre or post pain scores were excluded from the data analysis. This left a total of 160 patients with complete data for analysis. Most patients received one massage during their hospital stay (mean 1.2 massages) but 19 patients had two massages, and eight patients received three massages. Documented reasons for not having a pre or post pain score showed that the patients were either asleep by the end of the session or too somnolent to be able to articulate a pain score before or after treatment. Some patients expressed frustration with trying to come up with a pain number and felt they couldn't articulate one at the time. A therapeutic decision was made not to insist on a post pain level from the patient if he or she appeared to be on the cusp of sleep or in a deeply relaxed state, as we believe this would be counterproductive to healing. For instance, if a patient has been enduring a high pain level for an extended period of time and the massage has provided a respite from this high level, our experience shows us that asking the patient to articulate a pain level may actually bring back the pain experience. These patients were excluded from that analysis with the focus of meeting the needs of the patient first.

Baseline characteristics were similar among the patients who provided a full pain scale response, with a mean age of 61 years and an equal number of males and females (Table 1). Analysis was performed using an intent-to-treat basis, with the mean difference of pain.

The mean pain scale difference from pre to post was –3.49 ($p < .001$) (Table 2). Clinical staff did not report any problems related to the incorporation of massage therapy into the daily care routines. Only one patient out of the 160 receiving the massage reported

TABLE 1. Baseline Demographic Characteristics of the Patient Population ($N = 160$)

Gender	n	*Percentage*
Female	82	51.3%
Male	78	48.8%
Age (years)	*Mean (SD)*	*Median (range)*
	60.7 (15.8)	62 (15–91)

TABLE 2. Pain Scale Results Before and After Massage Following Thoracic Surgery

Time Relative to Massage	*Mean (SD)*	*Median*	*Minimum*	*Maximum*
Pre	5.58 (2.05)	5	1	10
Post	2.09 (2.07)	2	0	8
Difference	3.49 (1.72)	3	0	10

Paired-samples $t_{159} = 25.7$; $r = 0.65$; $p < .001$.

a subjective negative experience. Ten minutes into the treatment the patient requested the session be stopped, as his pain level was increasing. The patient declined repositioning and a change of body part being massaged.

Subjective Patient and Staff Comments

Some examples of patient responses after receiving a massage:

"The massage is what's getting me through my medical crisis."
"I feel I can breathe again."
"I wish you were around for the tests, I developed a terrible headache and no one knew what to do."
"That was wonderful, I can move my neck."
"Before massage treatment pain was radiating, after treatment pain has completely stopped radiating."
"That helped my entire body."
"I can't believe how relaxing that was; I am going to sleep now."

Subjective staff comments related to massage therapy included:

"The patients love it! They want another one."
"They would like a massage every day."
"Even if the patient feels like they are in too much pain to have a massage I talk them into trying it. Once they try a massage they can't believe the difference. The pain is still there but they feel they can work with it."
"Massage calms them."
"They are more ready to face the day and do the walks or get up to the chair."

DISCUSSION

This study demonstrates that massage therapy can be successfully integrated into a high-volume thoracic surgical practice. Based on these initial findings, massage therapy provides both subjective and objective benefits for thoracic surgical patients for enhanced pain management. As well, patients' comments related to the experience of receiving massage were, in general, positive. This study also highlights the specific process and reality of providing massage therapy in a hospital environment and specifically with thoracic surgery patients. The massage therapy provided in this study was a picture of the reality of how massage is provided in hospital clinical practice. Massage therapy in the hospital setting needs to be focused on individual patient symptoms, and then the therapy is individualized based on these symptoms, medical status, and positioning tolerance.

Future trials may be required to determine the optimal frequency, duration, and timing of massage therapy in the postoperative thoracic surgery setting. Other surgical populations may benefit from massage as well as an additional pain management strategy, and additional studies for various surgical populations are warranted. There are potential benefits to adding complementary therapies such as massage and potentially other mind–body therapies to a program for management of pain in the hospital setting.

CONCLUSION

General thoracic surgical patients face considerable challenges in the postoperative period. This pilot study suggests that massage therapy is an intervention with potential to help patients deal with some of the more common problematic challenges, such as pain and anxiety. If future studies confirm these preliminary findings, postoperative massage therapy may have a clinically significant role in helping patients recover optimally from surgery.

CONFLICT OF INTEREST NOTIFICATION

The authors have no conflicts of interest to declare.

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