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The Efficacy and Safety of Massage Therapy for Cancer Inpatients with Venous Thromboembolism

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Abstract

Background: Cancer patients have a 4 to 7 fold increase in the frequency of Venous Thromboembolism (VTE) during treatment and VTE is a common cause of death. Oncology massage has been traditionally contraindicated in patients with thromboembolism, but studies show oncology massage improves symptoms and quality of life.

Objectives: The purpose of this study was to review the safety and patient reported outcomes of massage in oncologic patients with a recent history of VTE.

Methods: After obtaining UT MD Anderson institutional review board approval, 25 patients who received oncology massage for symptom relief and quality of life, following the diagnosis of VTE were retrospectively reviewed. Edmonton Symptom Assessment Scale (ESAS) scores were reviewed pre- and post-massage, as well as complications within 30 days requiring return to the Emergency Room or hospital re-admission.

Results: 19 patients with complete ESAS scores reported a significant improvement in pain, fatigue, anxiety and well-being. Eleven patients (44%) returned to the emergency department within 30 days of their most recent massage, due to disease progression, fatigue and diarrhea. None of the 25 patients had complications due to massage. One patient experienced a new VTE 7 days after finishing massage, (patient was off anti-coagulation secondary to a pseudoaneurysm bleed).

Conclusions: Our study suggests that if precautions are taken not to massage the anatomic site of the VTE, patients are afebrile and have >50,000 platelets with no coagulopathy, oncologic massage is a safe, non-invasive intervention even following VTE for improvement in generalized pain, fatigue and quality of life.

Keywords Massage; Oncologic; VTE; Symptom Control; Pain

Introduction

Venous Thromboembolism (VTE) including deep vein thrombosis (DVT) and pulmonary embolus (PE) is a life threatening complication for hospitalized patients. Compared to the general population, cancer patients are at a 4-fold increase in the frequency of VTE, and as high as a 6-fold increase during chemotherapy [1]. These patients also have significantly worse survival, suffering from higher rate of complications of bleeding and recurrent VTE [2]. Patients often suffer pain, swelling of the limb affected, and shortness of breath caused by VTE. Patients may seek Complimentary Alternative Medicine (CAM) as a non-pharmacologic adjuncts to symptom management. Although there is no scientific evidence that indicates massage therapy helps cure cancer, cancer patients mostly use massage therapy to help in coping and improving quality of life [3]. Massage therapy is increasingly used for managing symptoms associated with cancer and VTE symptoms to help with improving quality of life. Changes in symptoms were reduced by approximately 50% over a 3 year course in 1,290 treated patients with benefits persisting over a 48 hour follow up [3]. Previous studies suggest that oncologic massage can help with pain, fatigue, anxiety, nausea and depression [3-5]. In a review of published studies, on the use of massage therapies for cancer patients, the most consistent symptom reduction was anxiety reduction [6].

Guidelines often contraindicate or caution massage therapy on patients with VTE [7]. Massage therapists are often taught early in their career that a client with diagnosed blood clots is not a good candidate for circulatory massage [8,9]. In our major cancer center, patients with all tumor types on various inpatient services still request massage therapy despite VTE. This study was performed to determine the frequency of oncologic massage for cancer patients with VTE, to measure patient-reported outcomes of massage, and to determine if any adverse outcomes resulted from oncologic massage therapy sessions.

Methods

Study design

After obtaining UT MD Anderson institutional review board approval, a retrospective chart review was conducted of patients referred to Integrative Medicine at UT MD Anderson Cancer Center for oncologic massage between January 1, 2015 and July 1, 2016. This study was a retrospective chart review of cancer inpatients with a

history of VTE who underwent oncologic massage. All patients were included in this retrospective chart review. Patients were included if they had a medical diagnosis of VTE in the past at any time point.

Intervention

Patients were referred to the Integrative Medicine department for massage and were cleared by an Integrative Medicine physician prior to being seen by a massage therapist. The therapist then completed his/her own assessment including a review of the patient's vital signs, complete blood count and tumor site(s) to determine if any contraindications to massage were present. The massage therapist then performed oncology massage as tolerated for the patient on an average of two to three visits weekly.

The levels of massage are as follows and all were performed with fragrance free lotion:

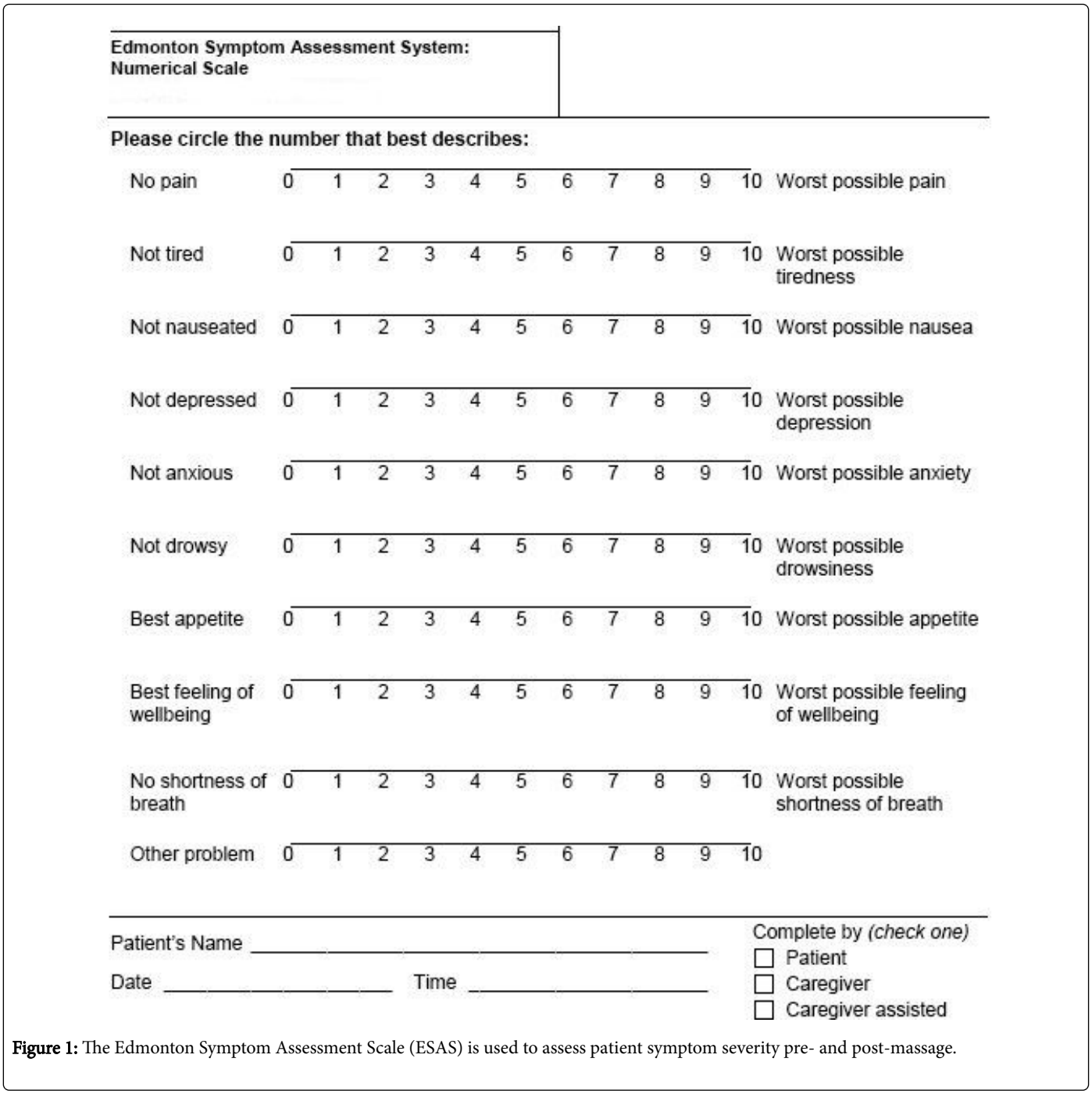
- **Level 1:** Manipulation of the epidermis with little to no skin movement
- **Level 2:** Manipulation with skin movement to the epidermis, dermis, adipose tissue and superficial muscle
- **Level 3:** Manipulation of all outer skin tissues, superficial muscle, myofascial compartments to include the epimysium, perimysium, endomysium

Massage therapy was not performed on any body part overlying tumor site(s), the affected limb of the VTE, or if the patient had a fever, platelet count of less than 50,000, or declined treatment.

Treatments were discontinued per patient preference, active medical issues precluding massage, if the patient moved out of region, or death.

Data collection

Collected data included weight, blood pressure, respiratory rate, oxygen saturation and oxygen requirement, and the Edmonton Symptom Assessment Scale (ESAS) (Figure 1). The ESAS is a verified clinical tool and numerical 0-10 scale of nine symptoms including pain, anxiety, appetite and sleep that is utilized to assess patient symptom control [10]. The dates of VTE diagnosis and radiologic exams including venous Doppler ultrasounds were recorded. Charts were reviewed for return to the Emergency Department with 30 days and reason for return including adverse events after oncologic massage appointments. All inpatient and outpatient massage therapy sessions were included in this study.



Edmonton Symptom Assessment System: Numerical Scale

Please circle the number that best describes:

No pain	0	1	2	3	4	5	6	7	8	9	10 Worst possible pain
Not tired	0	1	2	3	4	5	6	7	8	9	10 Worst possible tiredness
Not nauseated	0	1	2	3	4	5	6	7	8	9	10 Worst possible nausea
Not depressed	0	1	2	3	4	5	6	7	8	9	10 Worst possible depression
Not anxious	0	1	2	3	4	5	6	7	8	9	10 Worst possible anxiety
Not drowsy	0	1	2	3	4	5	6	7	8	9	10 Worst possible drowsiness
Best appetite	0	1	2	3	4	5	6	7	8	9	10 Worst possible appetite
Best feeling of wellbeing	0	1	2	3	4	5	6	7	8	9	10 Worst possible feeling of wellbeing
No shortness of breath	0	1	2	3	4	5	6	7	8	9	10 Worst possible shortness of breath
Other problem	0	1	2	3	4	5	6	7	8	9	10

Patient's Name _____

Date _____ Time _____

Complete by *(check one)*

☐ Patient

☐ Caregiver

☐ Caregiver assisted

Figure 1: The Edmonton Symptom Assessment Scale (ESAS) is used to assess patient symptom severity pre- and post-massage.

Outcome measures

The primary outcome was the effect of massage therapy in symptom improvement as defined by ESAS in cancer patients with VTE. Secondary outcomes included the frequency of VTE patients receiving oncologic massage, and the frequency of adverse outcomes of VTE as a result of massage therapy.

Statistical analysis

Descriptive statistics were used to describe patient demographics and characteristics, as well as comparisons of ESAS symptom scores pre- and post-massage. The percentage of patients referred to oncologic massage with VTE events, with adverse events requiring return to hospitalization or Emergency Room visit was estimated. All quantitative data was analyzed with a 95% confidence interval.

Results

A total of 25 inpatients with VTE were referred to Integrative Medicine over the 1 year period. Six of the patients (25%) did not have complete ESAS scores, resulting in the analysis of 19 patients in this retrospective chart review. The six patients with incomplete ESAS

scores were included in analysis for post-massage complications. See Table 1 for demographic information.

Covariate	**Patients, n(%)**
All patients	19(100%)
Gender (Female)	10(52.6%)
Age (years)	55.1+14.3
Cancer Diagnosis	
Gastrointestinal	5(20.8%)
Liquid Tumor	4(16.7%)
Central Nervous System	3(12.5%)
Genitourinary	2(8.3%)
Lung	1(4.2%)
Sarcoma	1(4.2%)
Breast	1(4.2%)
Thyroid	1(4.2%)
Gynecologic	1(4.2%)
VTE diagnosis	
PE	7(36.8%)
Lower extremity DVT	7(36.8%)
Upper extremity DVT	5(26.3%)
VTE treatment/secondary prophylaxis	
Oral anticoagulation	17(89.5%)
IVC filter	2(10.5%)
Number of massages (average)	5.1+8.8
PE = Pulmonary Embolism; DVT = Deep Venous Thrombosis; IVC = Inferior Vena Cava	

Table 1: Pre- and post-massage ESAS (Edmonton Symptom Assessment Scale) scores for various symptoms in patients receiving oncologic massage.

Table 2 displays the average pre- and post-massage therapy ESAS scores. The greatest area of improvement was pain, with a significant mean decrease in ESAS score by 2.8 points. Other areas of significant improvement included fatigue, anxiety and feeling of well-being. No patients had immediate complications after any massage therapy sessions. Eleven patients (44%) returned to the Emergency Center (EC) within 30 days of their most recent massage, though the reasons tended to be due to disease progression or systemic symptoms aside from bleeding complications. The most common reason for return to EC was due to fall (4 out of 9 patients, 44%), pain (n=1, 11%), hypoxemia (n=1, 11%) related to primary tumor, altered mental status (n=1, 11%), febrile neutropenia (n=1, 11%) and new DVT (n=1, 11%). The patient found to have a new DVT had a known history of progressive PE but was off anti-coagulation due to a recent pseudoaneurysm bleed.

ESAS Symptom	Pre-Massage Score + SD	Post-Massage Scor + SD	p
Pain	5.07 + 1.64	2.25 + 1.70	<0.001
Fatigue	2.60 + 2.23	1.56 + 1.90	0.01
Nausea	0.20 + 0.66	0.04 + 0.28	0.12
Depression	0.52 + 1.50	0.23 + 0.88	0.25
Anxiety	0.96 + 1.59	0.24 + 0.66	0.01
Drowsiness	1.08 + 1.92	0.96 + 1.93	0.75
Appetite	1.35 + 2.31	1.41 + 2.50	0.9
Well-being	2.40 + 2.24	1.47 + 1.40	0.02
Dyspnea	0.67 + 1.41	0.87 + 1.49	0.61
Sleep	2.36 + 2.87	2.20 + 2.72	0.79
Bolded denotes statistical significance; SD = Standard Deviation			

Table 2: Pre- and post-massage ESAS (Edmonton Symptom Assessment Scale) scores for various symptoms in patients receiving oncologic massage.

Discussion

While there is no evidence that massage therapy in patients with cancer results in tumor spread or other complications [11], some massage therapists still hold a belief that cancer is a contraindication to massage [12]. Guidelines from American Massage Association include DVT in clients with cancer as a essential contraindication [13]. Specifically, deep tissue massage has been seen in two case reports as causing complications including hematoma and stent displacement [14,15]. Despite these reports, oncologic massage has been demonstrated to be generally safe and beneficial both quantitatively and qualitatively in our center [7,16]. The diagnosis of recent VTE falls under this category; however, our results further exemplify the safety of massage therapy in oncologic patients with VTE.

In the Integrative medicine program, patient satisfaction has been universally positive about their massage experiences and shown benefits in relief of pain, anxiety and distress [17]. Other cancer populations have seen benefits as well, with breast cancer patients reporting that massage while undergoing chemotherapy significantly reduced nausea [18]. In a pilot study on brain tumor patients, significant reduction in distress levels were seen while receiving massage therapy [19]. Patients tend to be interested in massage therapy in conjunction with their cancer treatment for a variety of symptoms. Our study suggests that in the oncology population, massage therapy is well tolerated, even in patients that have had a recent VTE. Furthermore, there was quantitative improvement seen on several aspects of the ESAS, including pain, fatigue, anxiety, drowsiness and feeling of well-being.

While there are certainly risks to massage therapy depending on the strength of massage and sites involved, in this retrospective review, there were no instances of any complications that could be directly attributed to the massage intervention. None of the patients developed pulmonary embolism or cerebrovascular accident or sequela. Patients who returned to ED for acute back pain, altered mental status, seizures, and febrile neutropenia were thought to be due to either side effects of

chemotherapy or of disease progression and its resulting functional decline. A potentially direct complication is the one instance of new DVT, though this was seen in a patient with known PE and was off anticoagulation at the time due to a bleed and potentially had a DVT but was not detected earlier. Two patients passed away within 30 days of massage: One patient choose comfort care measures and underwent palliative sedation and withdrawal of respiratory support, while the other patient experienced acute sepsis and hypotension, and shortly passed away thereafter. Future research should examine if complications from massage on VTE patients develop further from 30 days of massage therapy.

At our center, massage therapy is applied to patients with a recent VTE with certain precautions: if a patient has a recent VTE and is on treatment, the affected limb is avoided. If the patient has completed treatment for VTE, the affected limb may be massaged once a Doppler ultrasound demonstrates complete resolution of the clot. If a Doppler ultrasound is not attainable at the time, massage therapy may still be administered to the limb with level 1-2 massage once cleared by a physician. If the patient has a PE, massage is avoided in all 4 limbs until cleared by a physician and/or Doppler ultrasound demonstrates no VTE in any limb.

One potential limitation to this study includes sample selection since patients in this study were referred to integrative medicine for massage therapy. There is a possibility that this sample reflects patients who have potentially less risk factors than others. The consult to Integrative medicine was placed for these patients for oncology massage regardless of VTE presence. These patients had symptoms that jeopardized their full potential in rehabilitation, which were amendable by an Integrative approach.

Additional research is needed to clarify whether the benefits of oncology massage extend beyond temporary relief of symptoms, but this research will require large sample sizes to detect significant differences in study groups. Our study only sampled 25 patients within the time frame of the study. In addition, due to the differences in the number of massages each patient received, a large standard deviation was seen due to one patient receiving 25 visits as compared to other patients only receiving 1 to 6 visits, and therefore consistent and long-term benefits could not be assessed. Future studies looking at long-term outcomes and larger sample size would be beneficial to look at the sustainable effects of massage therapy, as well as recording any improvements in functional status. Future research should also look at other chronic co-morbidities such as diabetes, hypertension, etc., medications used to treat these co-morbidities, and diet and supplements on impacts on massage therapy and VTE.

Conclusion

Massage therapy is generally safe and encouraged for cancer inpatients who have a recent history of VTE for improvement of pain, fatigue, anxiety and well-being. We recommend avoiding massage directly over tumor sites and affected limb with VTE until cleared by Doppler or medically cleared. Further studies are needed to establish the effects of massage depending on various factors including the tumor type, functional status of the patient, and extent of thrombosis to determine the long term benefits for oncology massage in cancer patients with VTE.

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