

CASE REPORT

Individualized Aromatherapy in End-of-Life Cancer Patients Care: A Case Report

Qian Liu¹, Xiaohong Ning^{2*}, Lei Wang³, Wei Liu¹

¹International Medical Center, ²Department of Geriatrics, ³Department of Vascular Surgery, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100730, China

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Abstract As one of the methods of palliative care, aromatherapy has been applied gradually in clinical nursing work in China in recent years. Through aromatherapy, terminal cancer patients can get not only relieves of physical symptoms, but also spiritual relaxation and peace, thus have improved quality of life at the end stage. In this paper, we report in detail about how aromatherapy was applied for symptom control in a cancer patient with unknown primary malignancy and multiple metastasis and its effects on the terminal life of this patient.

THE theory of "hospice" has been published for more than half a century. It has been promoted increasingly in medical systems of many countries. When disease becomes irreversible, the core conception as in hospice and palliative care is to relieve pain, maintain dignity and improve quality of life.¹

Aromatherapy uses plant essence extracts from aromatic plants to cure, alter or improve the healing of body and mind. Plant-derived essential oils contain highly volatile compounds that can release physical and mental symptoms and im-

prove quality of life for patient at the end of life, instead of healing the disease. As one of multiple therapeutic methods in palliative care, aromatherapy has been promoted and used widely in the United States, United Kingdom, Germany, Australia, Japan and some other countries. Its application in the treatment of various health conditions and its effectiveness of improving overall wellness can be traced from antiquity. In the current case, we report a cancer patient with multiple metastatic diseases from unknown primary tumor who was suffering from pain, nausea, lower limb edema and insomnia. Individualized aromatherapy was performed and significant relieves of his symptoms were observed. The patient passed away peacefully.

CASE DESCRIPTION

History, examines and diagnosis

A 32-year-old man was hospitalized due to diarrhea and stomachache for more than a year, lumbosacral pain for two months, as well as pitting edema in both

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*Corresponding author Tel: 86-10-69154065; E-mail: ningxh1973@foxmail.com

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lower extremities. In January 2017, diarrhea and weight loss occurred for no incentive. These conditions were improved through symptomatic treatment. In late December 2017, the patient begun to suffer from periumbilical and upper abdomen pain again, NRS 2-4 points, for no obvious incentive, accompanied with right waist ache radiating to the right inguinal region, NRS 7-8 points. The patient was diagnosed as kidney stone at local hospital, received extracorporeal lithotripsy, with somehow relief of suffering. In April 2018, the lumbosacral pain progressively aggravated, NRS 7-8 points, which had seriously influenced his positioning, like sitting or lying, daily activities and sleeping, accompanied with poor appetite, diarrhea, and lacking in strength; meanwhile, the urine output decreased to 500 mL/d, the pitting edema reoccurred in both lower extremities and extended to scrotum. So the patient was sent to our hospital for emergent treatment.

The serum creatinine elevated to 502 $\mu\text{mol/L}$, pancreatic function examination and routine urine test were both negative. The serum tumor markers examinations showed significantly increases of CA19-9 (17310.0 U/mL) and CA24-2 (>150 U/mL). The urinary ultrasonography(US) showed bilateral hydronephrosis with dilated left upper ureter, and diffuse lesions in double kidney, suggesting posterior renal obstruction. Imbedding D-J tube of the left side failed, and the right D-J tube imbedding was successful, with subsequently increased urine volume and relieves of lumbago and leg edema, and Creatinine fell to 258 $\mu\text{mol/L}$. Abdominal ultrasonography(US) showed multiple solid nodules in liver, hepatic portal vein thrombosis, spongiform degeneration, enlarged pancreas with abnormal echogenicity, and splenomegaly. PET-CT indicated peripancreatic, retroperitoneal and mesenteric multiple hypermetabolic lymph nodes; multiple hypermetabolic metastasis in the liver and in vertebral body, both lungs, accompanied by abdominal and pelvic effusion and pleural effusion. Liver biopsy of hepatic lesion demonstrated poorly differentiated adenocarcinoma. Thus, the diagnosis of metastatic poorly-differentiated adenocarcinoma was made, the primary lesion was unknown.

Clinical management

As patient's general situation was poor, Zubrod-ECOG-WHO(ZPS) 3 points,² it was difficult for the patient to tolerate chemotherapy. Radiotherapy was considered by his attending doctors at first, but due to the inconsistency between pain and location of the disease, ra-

diotherapist did not use radiotherapy to him.

The patient was successively given oxycodone-acetaminophen tablets 1# tid, morphine sulfate controlled-release tablets 10 mg Q12h, oxycodone hydrochloride controlled-release tablets 20 mg Q12h, and transdermal Fentanyl 8.4 mg for analgesia. Although the pain was relieved, the patient began severe dizziness, nausea and vomiting. The medication had to be adjusted. Dose of Oxycodone hydrochloride controlled-release tablets was reduced to 10 mg Q12h, and transdermal Fentanyl 4.2 mg, with oxycodone-acetaminophen tablets 1# PRN (*Pro re nata*). The pain symptom was slightly controlled, NRS was 5-7 points at appropriate body position and 8-10 points when changing the body positions. Patient still vomited 3-5 times per day due to tumor irritation and pain control medication.

In view of the portal vein thrombosis, the anticoagulant therapy with Low-Molecular-Weight Heparins Sodium injection 6000U q12h was conducted after consulting vascular surgery. Because obvious edema of both lower extremities, vascular US of both lower extremities was performed and venous thrombosis was eliminated. Consequently, the patient received supporting treatments including intake control, diuresis, supplementation of proteins, etc. However, there was no significant improvement of his symptoms. The patient complained lumbosacral pain, heaviness and swelling of the lower extremities, difficulty in moving body, which had seriously affected his daily activities and sleeping.

Aromatherapy

As the patient was in the terminal stage of cancer, and the family members hoped to alleviate the patient's discomfort as much as possible and smoothly pass the terminal stage, palliative care specialist was invited for consultation. Considering the poor control effect of medication on the systemic symptoms, the patient was referred to aromatherapy group for better management of patient's current symptoms.

The nurses in aromatherapy group carried out bedside assessment to the patient, and communicated with the patient and his family members to ensure patient and his families understand the disease with proper expectations on the prognosis. The therapeutic efficacy, performance, possible side effects of aromatherapy were explained thoroughly. The patient described the lumbosacral pain as the major suffering, hoped to alleviate the pain and reduce the dosage of painkillers through aromatherapy, as well as to improve the condi-

tions of edema of lower extremities, nausea and sleep disorders. The existing problems and clinical managements of the patients are illustrated in **Fig. 1**. Based on patient's major complaints, the pain, edema of both lower extremities, nausea and vomiting, we performed aromatherapy treatment with compound essential oils. The oil selection, compatibility, mechanism and performance for each symptom controlling were described in detail in **Table 1**. (video available at <http://cmsj.cams.cn>)

Effects feedback and scheme adjustment

Pain: The patient described that the pain at the area of massaging was relieved after the first time application, and the lumbosacral pain was reduced to 5-6 NRS points when move the body position and 3-4 NRS points at the appropriate body position, which was moderate pain. At the follow-up visit after 3 days application, the family member told us that the patient felt comfortable, and the coadministration of painkillers had basically controlled his pain, so that he was able to fall asleep easily. The NRS points of the patient fell to 3. This formula of aromatherapy was applied continuously

to the patient during his terminal stage.

Edema of lower extremity: The patient's thigh circumference (10 cm above patella) reduced slightly after 3 days application (Left: from 50 cm to 49 cm; right: from 49 cm to 48.5 cm). The family reported that, after daily massages several times, the patient felt better with the swelling of legs, accompanied with a better ability to move his legs. The patient continued to use this regimen.

Nausea and vomiting: We attempted to evaluate the effect on nausea and vomiting by scales of symptoms. Considering the self-rating scale has to be complete by patient himself, which was likely to induce or aggravate his nausea and vomiting behavior and cause his bad experience, we decided to just record patient's frequency of nausea and vomiting per day by family's observation. On the follow-up visit after using spray and sniffing rod for 3 days, the frequency of nausea was reduced to 3-5 times per day, and no vomiting at all. The patient expressed his desire for better sleeping, so after discussing with his family, we adjusted the spray formula, peppermint was replaced by true lavender.

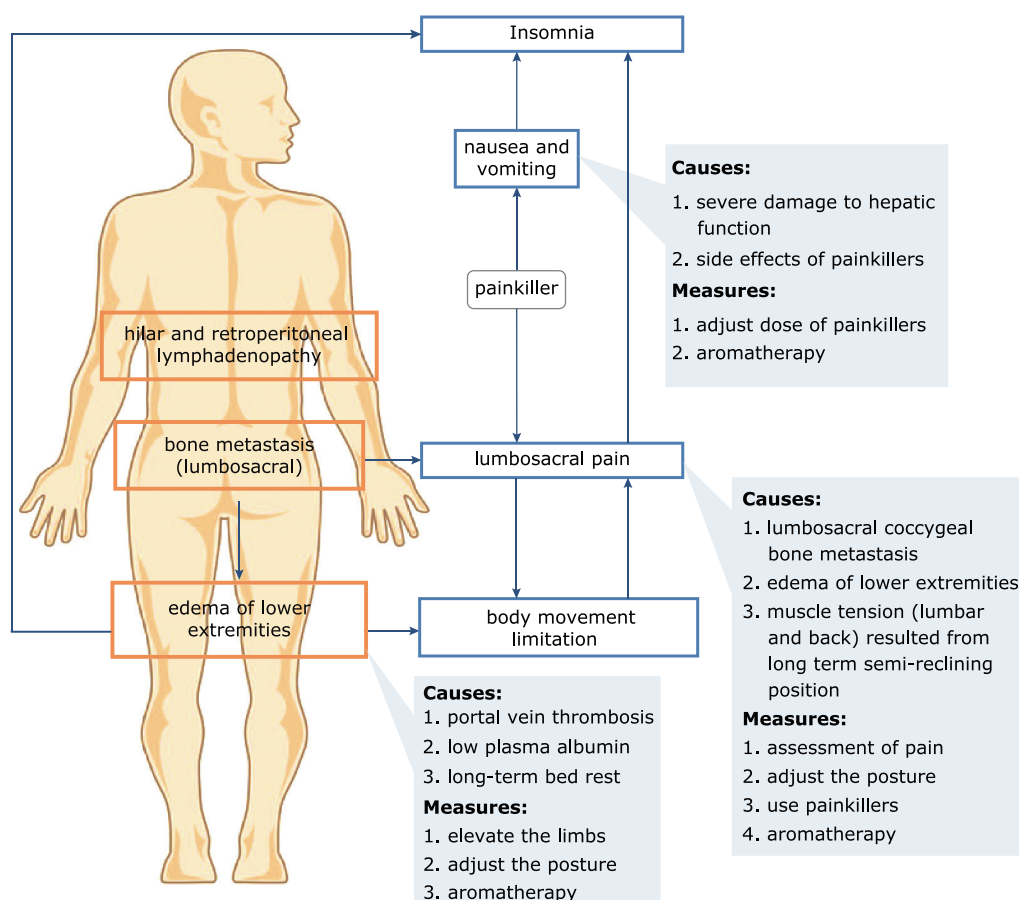


Figure 1. Illustration of patients' major complains, main symptoms, causing pathologies and clinical managements.

Table 1. Aromatherapy treatment plan: formula of compound essential oil, working mechanism and performing methods

Symptom	Aromatherapy formula	Working mechanism	Method of application
Pain	1. Saint John's Wort 20 ml 2. Lavender 3 drops 3. Gaultheria 2 drops 4. Lemon eucalyptus 1 drop	• Saint John's Wort can relieve musculoskeletal pain, and has the mood-stabilizing and anti-depression effect;³ • the linalyl acetate and linalool in true lavender have the effects of local anesthesia, anti-muscle spasm, and can also soothe anxiety and uneasiness;^{4,5} • the main composition of gaultheria is methyl salicylate, which has good analgesic and anti-spasm effects;⁵ • citronellal in lemon eucalyptus has the pain-relieving effect.^{6,7}	• Take 5 ml and smear it on the lumbosacral region of the patient and gently massage for 10 minutes. • Massage every 2 hours, • or give massage when the patient felt necessary.
Edema of lower extremity	1. Sweet almond 30 ml 2. Grapefruit 4 drops 3. Cypress 3 drops 4. Vetiver 2 drops	• Sweet almond oil can lubricate, and it is suitable for massage; • grapefruit and cypress have the effect of improving fluid retardation, excessive body fluid, and eliminating edema;⁸ • the furocoumarin in grapefruit also has an anti-depressant effect; • vetiver has the effect of promoting blood circulation and deep relaxation; • grapefruit and herb can be used together to soothe patients' mood and improve their sleep.	• Gently massage the lower extremities from distal end to proximal end for purpose of good absorption of the essential oil, instead of helping drainage.* • Changing gesture if patient felt tired or intolerable during performance. • massage for about 10 minutes, or till the patient fell asleep.[#] • Perform massage 2-4 times a day.
Nausea and vomiting	1. 75% ethyl alcohol 50 ml 2. Bergamot 15 drops 3. Sweet orange 10 drops 4. Peppermint 5 drops	• Bergamot, sweet orange and peppermint essential oil can alleviate nausea and anxiety. • The combined use of three essential oils can prevent the maladaptation of a single essential oil due to its high concentration and single smell.⁹	• Spray in patient's room 4 times a day. • Put 10 drops of compound oil (Bergamot and Sweet orange) on the sniff stick for patient to smell when the symptoms were severe.

*Video available as supplementary material. [#]Put compound oil in the palm and let the patient smell it before massaging; ask the patient about his feeling during the massage. Family members were taught to perform the massage. Instructions in operation and cautions of the massage were given. The massages were performed after eliminating venous thrombosis of lower extremities.

DISCUSSION

The word aromatherapy was first proposed by a French chemist Rene Morris Gedfose and applied to the wounded soldiers in the First World War. In the Second World War, a French military doctor Jean Vaughn applied aromatherapy to clinical medical practice. After Shirly Price published the book *Aromatherapy for Health Professionals*, it sparked the attention of the UK medical care community. Since then, the United States, France, the United Kingdom, Australia and many other countries have carried out many clinical researches on application of essential oils. More and more medical care providers accept that aromatherapy, as a complementary therapy, is beneficial to palliative patients. It relieves the patient's anxiety and depres-

sion, alleviates pain, reduces the dose of drugs and the related adverse effects, thus bring physical and mental comfort and peace to suffering patient with improved quality of life.^{10,11}

In recent years, aromatherapy has been used as a supplementary medical method clinically, especially in the fields of pain relief, emotional improvement, antibacterial and anti-inflammatory treatment and palliative care. It has many advantages, such as the improvement in the patient's comfort level, little adverse reactions, and saving medical resources.¹² In this case, aromatherapy was used to treat various symptoms and uncomfortableness at the end of life, and good feedback was received. The patient was not tolerant to nausea and vomiting induced by painkillers, and the repeated nausea and vomiting made the patient to

reject painkillers, thus aggravated the pessimistic mood of the patient. Aromatherapy had no gastrointestinal stimulation for its exogenous administration, so it was easier for the patient to accept; simultaneously, the synergy of different essential oils could not only ease the pain, but also relieve the anxiety and depression mood; the performance of massage with essential oil could increase the communication between the patient and his family members, thus make the patient feel being emotionally close to the family, and more willing to express his inner feelings, so as to relieve inner discomfort.

It was found that the effect of aromatherapy on edema was not as significant as that on pain, nausea and vomiting, suggesting that aromatherapy is more effective on subjective complains. Aromatherapy improves patient's wellbeing by local therapeutical effects of essential oil, as well as by relieving emotional stress such as anxiety and depression through engaged love and attention of caregivers, especially family members, while massaging. Patients can get a better personal experience that cannot be achieved by any other treatment measures.

Because aromatherapy is completed with the joint efforts of doctors, nurses, family members and patients, patients' trust and dependence on medical staff has been improved, and patients are willing to express their wishes and feelings, fully at ease to discuss the possible deaths, and live through the denial period in a stable and smooth manner. On the other hand, the evasive attitude of traditional Chinese families towards death usually make patients lose the last chance of communication with their family, while the aromatic therapy process can provide an effective opportunity for family members to communicate with patients, express their feelings to each other. In this way, aromatherapy improve the accompanying quality of family members, enhance the intimacy between family members and the patient, and help family members live through the pains of losing the loved ones more calmly.

Currently, benefits of aromatherapy in the patient care have been recognized, and there have been many relevant studies. However, most of studies and practices lack individualization. When carrying out aromatherapy for patients, it is necessary to make whole consideration from all aspects of a patient, such as his/her all relationships, the whole environment, and the whole-body condition, etc., which requires the expertise of aromatherapy professionals. Some clinicians

and nurses do not familiar enough with aromatherapy, some even take an unacceptable attitude to it. It is important for aromatherapy practitioners with expertise to lecture in medical staff on relevant knowledge of aromatherapy, and apply aromatherapy clinically in patient care, so that its clinical value and benefits can be well recognized.

At present, aromatherapy care in many other countries has been adopted in the medical care system and can be charged as a medical service, while most of essential oil products we use are purchased by nurses at their own expense. In Chinese Taiwan, the essential oil products are free for patients and in self-help by the essential oil manufacturers, or, donated by the families of deceased patient. It is necessary for the mainland China to find a suitable payment model to provide sustainability of aromatherapy service for patients who are truly in need of it. In addition, "palliative medicine" is a systematic approach to support patients and families with life-threatening illnesses. Therefore, aromatherapy can also be used in caring for family members of terminal patients in future.

Consent

Written informed consent was acquired from the family member of the patient reported in this article.

Statement of conflict of interest

The authors declared no conflict of interests.

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