



The relationship between malignant wound status and pain in breast cancer patients



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ABSTRACT

Purpose: Skin metastasis is one of the most frequent metastases in breast cancer patients. Patients with malignant wounds experience numerous symptoms, including serious wound pain. However, the features of pain related to malignant wounds have not been investigated. Nurses can experience a dilemma when treating these patients due to a lack of knowledge of the pain. The aims of this study were to examine the quality and intensity of malignant wound pain and to determine the association between wound status and pain in the patients with malignant wounds.

Methods: Cross-sectional study was conducted. Participants were recruited from a breast centre based in a general hospital. We collected the patients' demographic and wound management data and assessed wound condition. Patients evaluated wound pain intensity and quality over the preceding week using the short-form McGill Pain Questionnaire (SF-MPQ). The association between SF-MPQ results, wound condition, and the time interval for wound care was evaluated using the Spearman's correlation coefficient. The protocol was approved by the Ethical Committee of the each facilities.

Results: The median age of the 22 enrolled patients was 61.5 years, and the median time after diagnosis of malignant wound was 15.5 months. Overall, 77.3% of patients complained of pain. Malignant wound pain significantly correlated with the degradation of wound edges, granulation tissue, and the time interval for wound care.

Conclusion: We consider that it is necessary to provide pain-control care focused on the wound edge and granulation tissue of malignant wounds through the assessment of malignant wound pain and condition.

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1. Introduction

Breast cancer incidence increases annually worldwide, and it is a primary cancer among women (Ito et al., 2009). Breast cancer may metastasise to the lung, liver, bone, brain, and skin, with especially high rates of metastasis to skin sites (Elder et al., 2006). These skin metastases are called malignant wounds. Malignant wounds can be caused by direct invasion of the skin by cancer or by metastasis to the skin. These wounds have both ulcerative or fungating features. Patients with malignant wounds can develop numerous symptoms, including pain, exudate, infection, odour, and bleeding, which cause psychological distress (Gibson and Green, 2013; Maida et al.,

2009; Merz et al., 2001; Naylor, 2002; Probst et al., 2009; Schulz et al., 2002). Therefore, comprehensive palliative care to control these symptoms is needed for patients with malignant wounds, from treatment, follow-up care, and end-of-life care.

Probst et al. reported that 50% of patients with malignant wounds needed to manage their pain. The causes of pain in breast cancer patients with malignant wounds were assumed to be the progression of cancer, infection, and peri-wound dermatitis caused by wound exudate. However, the features of pain related to malignant wounds in breast cancer patients have not been investigated. Nurses can experience a dilemma when treating these patients due to a lack of knowledge of the pain, thereby potentially providing insufficient management of wounds. Recently, a short form of the McGill Pain Questionnaire (SF-MPQ) has been used to evaluate various types of pain. A Japanese version of the SF-MPQ is available (Yamaguchi et al., 2007). It is a self-report questionnaire

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consisting of three major dimensions – sensory, affective, and total descriptors. Because the SF-MPQ provides qualitative and quantitative information, it may help nurses to understand more fully the quality and/or intensity of the malignant wound pain in breast cancer patients (Lo et al., 2012).

The aims of this study were to examine the quality and intensity of pain and to determine the association between wound status and pain in breast cancer patients with malignant wounds.

2. Methods

2.1. Study design and participants

A cross-sectional study was conducted. Participants were recruited from the outpatient department of a breast centre based in a general hospital in Japan between February 2010 and June 2011. Inclusion criteria were participants over 18 years of age presenting with a breast malignant wound. Patients with breast malignant wounds were diagnosed by the criteria of the hospital, which were (i) skin invasion near the breast cancer site or (ii) pathology reports from a breast tissue sample (oestrogen receptor, progesterone receptor, and human epidermal growth factor receptor type 2 [HER2] proteins). Exclusion criteria were participants in critical condition, as determined by physicians. Patients received standard wound management by nurses certified in wound, ostomy, and continence nursing or cancer pain management nursing in the hospital. The protocol was approved by the local Ethical Committees of our institution and an affiliated hospital. Written informed consent was obtained from all the participants.

2.2. Data collection

Demographic characteristics were collected from medical records by the lead researcher and included the following: age, hormone receptors, HER2 proteins status, time after diagnosis of breast cancer, time after diagnosis of malignant wound, location of malignant wounds, metastatic site, treatments, administration of analgesic drugs, wound management, performance status, and comorbidity. Performance status by Eastern Cooperative Oncology Group as rated from 0 to 4, with 0 denoting perfect health and 4 indicated patients who were bedbound (Ando et al., 2001; Oken et al., 1982).

The patients provided malignant wound care on an outpatient basis. During wound care, the lead researcher assessed the wound and the condition of the surrounding skin by visual inspection and palpation (pressing down with a finger and pinching of tissues), using the Bates-Jensen wound assessment tool (BWAT) and DESIGN (Bates-Jensen et al., 1992; Sussman and Bates-Jensen, 2007). BWAT evaluates 13 wound characteristics, including wound size, depth, edges, undermining, necrotic tissue type and amount, exudate type and amount, skin colour surrounding the wound, peripheral tissue oedema and induration, granulation tissue, and epithelialization, with a numerical rating scale. Induration is abnormal firmness of peri-wound. A high score indicates a severe condition. The reliability and validity of this tool have been verified (Bates-Jensen et al., 1992). DESIGN is a tool for scoring the severity of wounds, including pressure ulcers. It was developed by the Scientific Education Committee of the Japanese Society of Pressure Ulcers in 2002. DESIGN consists of seven components: depth, exudate, size, inflammation/infection, granulation tissue, necrotic tissue, and pockets (undermining). The total score is calculated, and a high score indicates greater severity. The reliability and validity of DESIGN have been shown (Sanada et al., 2004). The BWAT total score was positively correlated with DESIGN-R total score ($r = 0.89$, $P < 0.0001$). In this study, the inter-rater reliability of BWAT score

was evaluated with separate raters (a plastic surgeon, a wound care nurse, and the lead researcher). The raters were assessed by calculating the rate of agreement on scores for photographs of malignant wounds ($\kappa = 0.72$ – 0.91 for each item).

During wound care, digital photographs of the wound and peri-wound skin were taken with a digital camera (COOLPIX, NIKON, Tokyo, Japan). Wound size on the digital photograph was measured three times using the ImageJ software program (National Institutes of Health, Maryland, USA), and the median value was used for analysis. We interviewed patients about wound management (time interval to exchange dressings) related to wound pain.

After wound care by the lead researcher, the patients answered the questionnaire related to their wound pain intensity and quality using the SF-MPQ. The SF-MPQ is the most widely used tool for assessing pain experience. Participants evaluated the SF-MPQ by rating the intensity and quality to which they experienced the average wound pain in the past week. The main component of the SF-MPQ consists of 15 descriptors (11 sensory and 4 affective) rated on a 4-point intensity scale (0 = “none” to 3 = “severe”). The SF-MPQ also includes a 6-point present pain index (PPI) and a visual analogue scale (VAS), which measure overall pain intensity as a single dimension (Melzack, 1987). The reliability and validity of SF-MPQ Japanese version have been shown (Yamaguchi et al., 2007).

2.3. Statistical analysis

Data are presented as the median (range) or the number with percentage (%). The strength of the association between SF-MPQ and the wound area, the BWAT score, and time interval of wound care was evaluated using the Spearman correlation coefficient. A P value of <0.05 was considered to be statistically significant. Statistical analyses were conducted using Statistical Analysis System Ver. 9.2 (SAS Institute Inc., Cary, NC, USA).

3. Results

3.1. Patient characteristics

Twenty-seven patients were recruited. Of these, three refused to participate and one was excluded because the wound was no longer present at the time of data collection. One patient fell ill during treatment and dropped out. As a result, our final assessment included 22 participants. The median age of the 22 patients was 61.5 (36–81) years, and the median time after diagnosis of malignant wound was 15.5 (1–87) months. The breast was the most common site of malignant wounds (68.2% of all cases). Nine patients had used nonsteroidal anti-inflammatory drugs and seven patients had taken opioids for pain regularly. For wound care, the malignant wounds of 18 patients were managed with gauze dressing and treated with sulfadiazine silver-containing cream ($n = 9$) or metronidazole cream ($n = 13$) (Table 1).

3.2. Malignant wound status and pain

The median wound size was 13.0 (0.18–151.1) cm^2 . The patients had wounds of various sizes and status. The wounds produced a large amount of purulent exudates (Table 2).

Overall, 77.3% of patients complained of pain. Fifty percent of these patients complained mild pain and 27.3% of them complained moderate pain. Of these, 40.9% experienced continuous throbbing pain that should be under control in the past week. On the other hand, 27.2–31.8% of patients had tender or aching pain in their malignant wounds. Table 3 shows the pain characteristics of malignant wounds based on SF-MPQ results.

Regarding wound status, the wound area did not correlate with

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