

Original Article

Cite this article: Takamizawa S *et al.* (2024). Psychological symptom burden associated with malignant wounds: Secondary analysis of a prospective cohort study. *Palliative and Supportive Care* 22, 396–403. <https://doi.org/10.1017/S1478951523000536>

Received: 18 October 2022
Revised: 26 January 2023
Accepted: 23 April 2023



Keywords:

Good Death Scale; Integrated Palliative Care Outcome Scale; Malignant wound; Psychological distress; Quality of life

Corresponding author:

Hiroto Ishiki;
Email: h.ishiki@03.alumni.u-tokyo.ac.jp

Psychological symptom burden associated with malignant wounds: Secondary analysis of a prospective cohort study

Shigemasa Takamizawa, M.D. ¹, Hiroto Ishiki, M.D. ¹, Shunsuke Oyamada, PH.D.², Yuma Takeda, M.D.¹, Daisuke Kiuchi, M.D.³, Koji Amano, M.D., PH.D.¹, Yosuke Matsuda, M.D.⁴, Naosuke Yokomichi, M.D., PH.D.⁵, Hiroyuki Kohara, M.D., PH.D.⁶, Kozue Suzuki, M.D.⁷, Eriko Satomi, M.D.¹ and Masanori Mori, M.D.⁵ on behalf of the East Asian Collaborative Cross-Cultural Study to Elucidate the Dying Process Investigators

¹Department of Palliative Medicine, National Cancer Center Hospital, Tokyo, Japan; ²Department of Biostatistics, JORTC Data Center, Tokyo, Japan; ³Department of Palliative Care, Center Hospital of the National Center for Global Health and Medicine, Tokyo, Japan; ⁴Palliative Care Department, St. Luke's International Hospital, Tokyo, Japan; ⁵Division of Palliative and Supportive Care, Seirei Mikatahara General Hospital, Hamamatsu, Japan; ⁶Department of Internal Medicine, Hatsuokaichi Memorial Hospital, Hiroshima, Japan and ⁷Department of Palliative Care, Tokyo Metropolitan Cancer and Infectious Disease Center Komagome Hospital, Tokyo, Japan

Abstract

Objectives. Patients with malignant wounds suffer from physical and psychological symptom burden. Despite psychological support being required, the impact of malignant wounds on patients' psychological distress is poorly investigated. We evaluated psychological distress associated with malignant wounds for patients at their end of life.

Methods. This study used the secondary analysis of the results of a large prospective cohort study, which investigated the dying process among patients with advanced cancer in 23 palliative care units in Japan. The primary outcome of this study was the prevalence of moderate to severe psychological symptom burden, evaluated by the Integrated Palliative Care Outcome Scale (IPOS)-feeling at peace scores of 2–4. In addition, the factors affecting psychological symptoms were investigated. The quality of death was also evaluated upon death using the Good Death Scale score.

Results. Out of the total 1896 patients, 156 had malignant wounds (8.2%). Malignant wounds were more common in female and young people. The breast, head, and neck were the most prevalent primary sites. More patients with malignant wounds had IPOS-feeling at peace scores of 2–4 than patients without malignant wounds (41.0% vs. 31.3%, $p = 0.024$). Furthermore, psychological distress was associated with moderate to severe IPOS-pain and the frequency of dressing changes. The presence of malignant wounds did not affect the quality of death.

Significance of results. This study showed increased psychological distress due to malignant wounds. Patients with malignant wounds require psychological support in addition to the treatment of physical symptoms for maintaining their quality of life.

Introduction

Malignant wounds occur when cancerous cells invade the epithelium, infiltrate the supporting blood and lymph vessels, and penetrate the epidermis (O'Brien 2012). This results in a loss of vascularity, and therefore, the loss of nourishment to the skin, leading to tissue death and necrosis (O'Brien 2012). Malignant wounds are caused by tumor cell metastasis from distant primary tumors, primary cutaneous tumor, and direct invasion of a primary tumor into the cutaneous structures (Alexander 2009). Malignant wounds are found in 5–15% of all cancers (Beers 2019; Tsihklakidou *et al.* 2019). Patients with breast cancer have the highest prevalence of malignant wounds (Maida *et al.* 2009). As the mammary glands and lymph nodes are located directly under the skin, the cancerous cells can easily invade the epithelium (O'Brien 2012).

The main symptoms that patients with cancer experience are fatigue, loss of appetite, pain, and dyspnea (Tewes *et al.* 2021), whereas the symptoms due to malignant wounds are more specific such as exudate, bleeding, odor, pruritus, and appearance changes. A previous report showed that 67.7% of patients with malignant wounds had at least one of these symptoms (Maida *et al.* 2009). In addition to these physical symptoms, patients with malignant

wounds experience psychological symptom burden (O'Brien 2012). Malignant wounds are lesions on the body surface that are directly visible to the patients and are, thus, a visible reminder for the patients that their body is breaking down in the dying process. Thus, patients with malignant wounds suffer from a devastating and often crippling symptom burden (Tilley et al. 2016). Hence, psychological support, as well as palliation of physical symptoms, is required to maintain their quality of life (QOL).

Despite the physical impact of malignant wounds being reported (Maida et al. 2009), the psychological impact of malignant wounds on QOL and their end-of-life status are poorly investigated. We hypothesized that patients with malignant wounds suffer from a psychological symptom burden due to a visible reminder that their body is breaking down in the dying process. Therefore, this study evaluates and clarifies the psychological distress associated with malignant wounds among patients at their end of life.

Methods

Study cohort

This study conducted a secondary analysis of the results of a large prospective cohort study known as the East Asian Collaborative Cross-cultural Study to Elucidate the Dying Process, which investigated the dying process among patients with advanced cancer in 23 palliative care units (PCUs) in Japan, between January 2017 and June 2018 (Hiratsuka et al. 2020). The inclusion criteria of the present study were (1) adult patients (18 years of age or older), (2) patients diagnosed with locally advanced or metastatic cancer, and (3) patients admitted to PCUs. Patients with missing data for outcome variables were excluded from the present study.

The protocol of this study was approved by the Institutional Review Board of each participating center, and informed consent was waived in accordance with local regulations. Patient registration was based on an opt-out model. This study was conducted according to the principles of the Declaration of Helsinki.

Procedure

In this secondary analysis, patients' clinical characteristics (i.e., sex, age, primary cancer site, presence of metastasis, and the Eastern Cooperative Oncology Group-Performance Status [ECOG-PS]), information about medication use, specific symptoms due to malignant wounds (bleeding, exudate, odor, and itching), and the status of malignant wounds were obtained upon admission. The physical and psychological symptom burden of patients was evaluated by the Integrated Palliative Care Outcome Scale (IPOS). The frequency of dressing changes was recorded as well.

IPOS

Physicians in the PCUs rated patients' physical symptom burden upon their admission on the 5-point Likert-IPOS, ranging from 0 = not at all; 1 = slightly; 2 = moderately; 3 = severely; to 4 = overwhelmingly (Hearn and Higginson 1999). The rated physical symptoms were pain, breathlessness, fatigue, anorexia, somnolence, and dry mouth. The IPOS is a valid and reliable outcome measure, which can assess and monitor symptoms and concerns in advanced illnesses, determine the impact of health-care interventions, and demonstrate the quality of care (Murtagh et al. 2019).

Table 1. Patient characteristics

	Patients with MWs (n = 156)	Patients without MWs (n = 1740)	Total (n = 1896)	p
Sex				
Male (%)	59 (37.8)	906 (52.1)	965 (50.9)	0.001
Female (%)	97 (62.2)	834 (47.9)	931 (49.1)	
Age, mean (range), in years				
	69.7 (25–98)	72.6 (29–100)	72.4 (25–100)	0.004
Primary site				
Gastrointestinal	28 (17.9)	491 (28.2)	519 (27.4)	<0.0001
Hepatobiliary and pancreatic	5 (3.2)	358 (20.6)	363 (19.1)	
Lung	9 (5.8)	310 (17.8)	319 (16.8)	
Urinary	6 (3.8)	135 (7.8)	141 (7.4)	
Breast	44 (28.2)	87 (5.0)	131 (6.9)	
Gynecologic	11 (7.1)	116 (6.7)	127 (6.7)	
Head and neck	30 (19.2)	38 (2.2)	68 (3.6)	
Other	23 (14.7)	205 (11.8)	228 (12.0)	
Metastatic				
Yes (%)	129 (82.7)	1476 (84.8)	1605 (84.7)	0.49
Liver				
	44	686	730	
Lung				
	68	640	708	
Bone				
	53	448	501	
Central nervous system				
	19	244	263	
No (%)	27 (17.3)	264 (15.2)	291 (15.3)	
ECOG-PS				
0–2 (%)	17 (10.9)	167 (9.6)	184 (9.7)	0.57
3–4 (%)	139 (89.1)	1573 (90.4)	1712 (90.3)	

ECOG: Eastern Cooperative Oncology Group; MW: malignant wound; PS: performance status.

The psychological symptom burden was evaluated by the "IPOS-feeling at peace" score. IPOS-feeling at peace is a score in which health-care professionals rate patients' emotional symptoms regarding whether she/he has felt at peace, ranging from 0 = always; 1 = most of the time; 2 = sometimes; 3 = occasionally; to 4 = not at all (Hearn and Higginson 1999). The inter-rater agreement of IPOS-feeling at peace between the patient and staff ratings was 72.4% (Murtagh et al. 2019).

The primary outcome of this study was the prevalence of moderate to severe psychological symptom burden, evaluated as an IPOS-feeling at peace scores of 2–4. Subsequently, the factors affecting psychological symptoms were also investigated.

Numerical rating scale for pain

Patients' pain was assessed using the numerical rating scale for pain (Pain NRS) in addition to the IPOS-pain score. Pain NRS is a scale

Table 2. The site, condition, and specific symptoms of malignant wounds

	Total (n = 156)
Site^a	
Chest and abdomen (%)	75 (48.1)
Face (%)	30 (19.2)
Neck (%)	27 (17.3)
Limb (%)	11 (7.1)
Lower back (%)	8 (5.1)
Other (%)	19 (12.2)
Condition^b	
Reddening (%)	59 (37.8)
Skin defects (%)	38 (24.4)
Necrosis (%)	50 (32.1)
Fistula (%)	24 (15.4)
Specific symptoms of MWs	
Exudate (%)	77 (49.4)
Bleeding (%)	43 (27.6)
Odor (%)	29 (18.6)
Itching (%)	7 (4.5)
Number of specific symptoms of MWs^c	
0 (%)	5 (3.2)
1 (%)	107 (68.6)
2 (%)	21 (13.5)
3 (%)	7 (4.5)
4 (%)	16 (10.3)
The frequency of dressing changes per day	
0 (%)	50 (32.1)
1 (%)	73 (46.8)
2 (%)	19 (12.2)
≥3 (%)	14 (9.0)

MW: malignant wound.

^aFourteen patients had malignant wounds with multiple sites.

^bFifteen patients had malignant wounds with multiple conditions.

^cSpecific symptoms of MWs: exudate, bleeding, odor, and itching.

to evaluate pain by the patients themselves; it is a single 11-point numeric scale (ranging from 0 to 10 from no pain to worst possible pain).

Good death scale

The quality of death of patients was evaluated upon death using the Japanese version of the Good Death Scale (Kodama *et al.* 2017). The Good Death Scale consists of 5 domains: (1) awareness; awareness about one's dying (0 = complete ignorance, 1 = ignorance, 2 = partial awareness, and 3 = complete awareness), (2) acceptance; peaceful acceptance of death (0 = complete unacceptance, 1 = unacceptance, 2 = acceptance, and 3 = complete acceptance), (3) propriety; honoring the patient's wishes (0 = no reference to the patient's wishes, 1 = following the family's wishes alone, 2 = following the patient's wishes alone, and 3 = following the

Table 3. Symptom burden of the patients with and without MWs on admission

	Patients with MWs (n = 156)	Patients without MWs (n = 1740)	Total (n = 1896)	p
IPOS-pain				
0–1 (%)	80 (51.3)	1052 (60.5)	1132 (59.7)	0.013
2–4 (%)	70 (44.9)	594 (34.1)	664 (35.0)	
Missing (%)	6 (3.8)	94 (5.4)	100 (5.3)	
Pain, NRS median	2.0	2.0	2.0	0.41
Opioid use				
Yes (%)	119 (76.3)	1087 (62.5)	1206 (63.6)	0.001
No (%)	37 (23.7)	653 (37.5)	690 (36.4)	
OMEDD, mean (range), in mg	87.1 (0.5–1200)	66.3 (1.2–1200)	68.4 (0.5–1200)	0.030
IPOS-breathless				
0–1 (%)	116 (74.4)	1300 (74.7)	1416 (74.7)	0.68
2–4 (%)	34 (21.8)	346 (19.9)	380 (20.0)	
Missing (%)	6 (3.8)	94 (5.4)	100 (5.3)	
IPOS-fatigue				
0–1 (%)	86 (55.1)	911 (52.4)	997 (52.6)	0.73
2–4 (%)	64 (41.0)	723 (41.6)	787 (41.5)	
Missing (%)	6 (3.8)	106 (6.1)	112 (5.9)	
IPOS-anorexia				
0–1 (%)	88 (56.4)	829 (47.6)	917 (48.4)	0.073
2–4 (%)	62 (39.7)	803 (46.1)	865 (45.6)	
Missing (%)	6 (3.8)	108 (6.2)	114 (6.0)	
IPOS-somnolence				
0–1 (%)	110 (70.5)	1260 (72.4)	1370 (72.3)	0.31
2–4 (%)	40 (25.6)	373 (21.4)	413 (21.8)	
Missing (%)	6 (3.8)	107 (6.1)	113 (6.0)	
IPOS-dry mouth				
0–1 (%)	114 (73.1)	1305 (75.0)	1419 (74.8)	0.24
2–4 (%)	36 (23.1)	325 (18.7)	361 (19.0)	
Missing (%)	6 (3.8)	110 (6.3)	116 (6.1)	
IPOS-feeling at peace				
0–1 (%)	85 (54.5)	1077 (61.9)	1162 (61.3)	0.024
2–4 (%)	64 (41.0)	544 (31.3)	608 (32.1)	
Missing (%)	7 (4.5)	119 (6.8)	126 (6.6)	
Antidepressant use				
Yes (%)	12 (7.7)	65 (3.7)	77 (4.1)	0.030
No (%)	144 (92.3)	1674 (96.2)	1818 (95.9)	
Missing (%)	0	1 (.06)	1 (.05)	

(Continued)

Table 3. (Continued.)

	Patients with MWs (n = 156)	Patients without MWs (n = 1740)	Total (n = 1896)	p
Delirium on admission				
Present (%)	37 (23.7)	505 (29.0)	542 (28.6)	0.17
Absent (%)	119 (76.3)	1235 (71.0)	1354 (71.4)	
Delirium during hospitalization				
Present (%)	62 (39.7)	637 (36.6)	699 (36.9)	0.41
Absent (%)	72 (46.2)	862 (49.5)	934 (49.3)	
Missing (%)	22 (14.1)	241 (13.9)	263 (13.9)	
Antipsychotics use				
Yes (%)	34 (21.8)	412 (23.7)	446 (23.5)	0.69
No (%)	121 (77.6)	1328 (76.3)	1449 (76.4)	
Missing (%)	1 (.64)	0	1 (.05)	
Benzodiazepine use				
Yes (%)	26 (16.7)	298 (17.1)	324 (17.1)	1.0
No (%)	130 (83.3)	1441 (82.8)	1571 (82.9)	
Missing (%)	0	1 (.06)	1 (.05)	
Non-benzodiazepine hypnotic use				
Yes (%)	11 (7.1)	108 (6.2)	119 (6.3)	0.61
No (%)	145 (93.0)	1631 (93.7)	1776 (93.7)	
Missing (%)	0	1 (.06)	1 (.05)	
Psychotropic drug use^a				
Yes (%)	66 (42.3)	695 (39.9)	761 (40.1)	0.61
No (%)	90 (57.7)	1045 (60.1)	1135 (59.9)	

IPOS: Integrated Palliative Care Outcome Scale; MW: malignant wound; NRS: numerical rating scale; OMEDD: oral morphine equivalent daily dose.

^aPsychotropic drug includes antipsychotics, benzodiazepine, non-benzodiazepine hypnotic, or antidepressant.

wishes of the patient and the family), (4) timeliness; death timing (0 = no preparation, 1 = the family alone had prepared, 2 = the patient alone had prepared, and 3 = both the patient and the family had prepared), (5) comfort; the degree of physical comfort 3 days before death (0 = a lot of suffering, 1 = suffering, 2 = a little suffering, and 3 = no suffering) (Higashibata et al. 2022). The outcome included the score for each domain and its total score. The Good Death Scale was developed as a quality-of-death measurement instrument for patients receiving palliative care in a hospice or a hospital and was completed by health-care providers. Its internal consistency, reliability, and validity have been confirmed for the Asian culture (Higashibata et al. 2022). The validity of a proxy evaluation of the Good Death Scale score, which is evaluated by a physician instead of the primary caregiver, has been reported (Cheng et al. 2013).

Statistical analyses

Comparisons among the 2 groups (patients with malignant wounds vs. patients without malignant wounds; patients whose IPOS-feeling at peace score 0–1 vs. 2–4) were made using the Fisher's exact test or Student's *t*-test as appropriate. Univariate and multivariate logistic regression analyses were also performed to evaluate the patient characteristics (age, sex, IPOS-pain, and IPOS-feeling at peace) associated with malignant wounds. All statistical analyses were performed using the JMP software (version 14.3.0 for Windows; SAS Institute Japan Inc., Cary, NC, USA). The results were considered statistically significant at a two-sided *p*-value of <0.05.

Results

Patient characteristics

From January 2017 to June 2018, 1896 patients were admitted to PCUs. Among them, 965 (50.9%) were males and 931 (49.1%) were females. The mean age was 72.4 years (range: 25–100). The major primary site was gastrointestinal in 519 patients (27.4%), hepatobiliary and pancreatic in 363 patients (19.1%), and lung in 319 patients (16.8%). The ECOG-PS of more than 90% of patients was 3 or 4.

Among 1896 patients, 156 (8.2%) had malignant wounds and 1740 (91.8%) did not have malignant wounds. Malignant wounds predominantly affected females ($p = 0.001$) and younger patients ($p = 0.004$). Breast (44 patients, 28.2%) and head and neck (30 patients, 19.2%) were the most prevalent primary sites for patients with malignant wounds. Table 1 presents the characteristics of the patients.

The site and condition of malignant wounds

Malignant wounds occurred mainly on the chest and abdomen ($n = 75$, 48.1%) and face ($n = 30$, 19.2%). Skin conditions observed due to malignant wounds were as follows: reddening ($n = 59$, 37.8%), skin defects ($n = 38$, 24.4%), necrosis ($n = 50$, 32.1%), and fistula ($n = 24$, 15.4%). On the one hand, the frequency of dressing changes was once a day or never in 78.8% of patients ($n = 123$) with malignant wounds. On the other hand, 21.2% of patients ($n = 33$) required dressing changes twice or more a day (Table 2).

Specific symptom prevalence due to malignant wounds

Among 156 patients with malignant wounds, exudate, bleeding, odor, and itching were specific symptoms due to malignant wounds and were observed in 77 (49.4%), 43 (27.6%), 29 (18.6%), and 7 (4.5%) patients, respectively. Among them, 44 patients (28.2%) had multiple symptoms due to malignant wounds (Table 2).

Physical and psychological symptom burden of the patients on admission

On admission, significant differences were found in the prevalence of moderate to severe IPOS-pain score (IPOS 2–4) between patients with or without malignant wounds (44.9% vs. 34.1%, $p = 0.013$), while the median Pain NRS was both 2.0 for patients with and without malignant wounds ($p = 0.41$). More patients with malignant wounds used opioids than patients without malignant wounds (76.3% vs. 62.5%, $p = 0.001$) and higher doses (mean

Table 4. Univariate and multivariate analyses of patient characteristics associated with malignant wounds

		Univariate analysis		Multivariate analysis	
		Odds ratio (95% CI)	<i>p</i> -value	Odds ratio (95% CI)	<i>p</i> -value
Age		–	0.004	0.99 (.98–1.001)	0.071
Sex	Male/female	0.56 (0.4–0.78)	0.001	0.56 (0.39–0.79)	0.001
IPOS-pain	0–1/2–4	0.65 (0.46–0.90)	0.013	0.75 (0.52–1.06)	0.10
IPOS-feeling at peace	0–1/2–4	0.67 (0.48–0.94)	0.024	0.72 (0.51–1.03)	0.072

CI: confidence interval; IPOS: Integrated Palliative Care Outcome Scale.

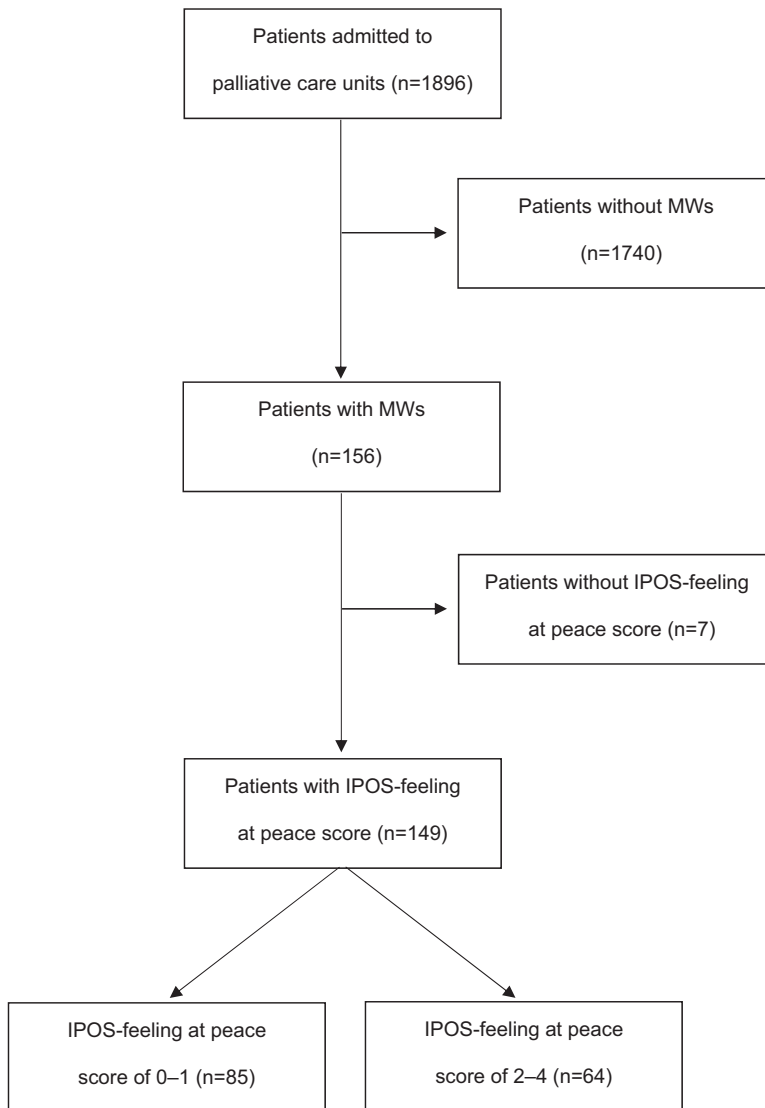


Figure 1. Flow diagram of patient selection. IPOS: Integrated Palliative Care Outcome Scale; MW: malignant wound.

oral morphine equivalent daily dose: 87.1 vs. 66.3 mg, $p = 0.03$). Results showed that 64 (41.0%) patients with malignant wounds and 544 (31.3%) patients without malignant wounds had IPOS-feeling at peace scores of 2–4, respectively ($p = 0.024$). More patients with malignant wounds used antidepressants than patients without malignant wounds (7.7% vs. 3.7%, $p = 0.03$) (Table 3).

Multivariate analysis showed that malignant wounds were significantly more common in females ($p = 0.001$). Patients with malignant wounds tended to have moderate to severe IPOS-pain

scores ($p = 0.10$) and IPOS-feeling at peace scores ($p = 0.072$), however, not significantly (Table 4).

The factors affecting psychological symptoms

Among 156 patients with malignant wounds, 149 patients were evaluated for their psychological symptom burden using IPOS-feeling at peace scores (Fig. 1). IPOS-feeling at peace score was

associated with the IPOS-pain score and the frequency of dressing changes. Among the 79 patients who had an IPOS-pain score of 0–1 and 69 patients who had an IPOS-pain score of 2–4, 26 (32.9%) and 38 (55.1%) patients had an IPOS-feeling at peace scores of 2–4, respectively ($p = 0.008$). Among the 32 patients with malignant wounds who required dressing change at least twice a day and 117 patients with malignant wounds who required dressing change once a day or never, 20 (62.5%) and 44 (37.6%) patients had an IPOS-feeling at peace scores of 2–4, respectively ($p = 0.015$).

On the other hand, IPOS-feeling at peace score was not associated with the presence of malignant wounds on the face, condition of malignant wounds, or specific symptoms due to malignant wounds (bleeding, exudate, odor, and itching), oral morphine equivalent daily dose, antidepressant use, and the number of symptoms (Table 5).

Good Death Scale scores in patients with and without malignant wounds

There was no difference between the patients with or without malignant wounds in awareness, acceptance, timeliness, comfort, and the total score on Good Death Scale, whereas the propriety score was significantly higher among patients with malignant wounds than among patients without malignant wounds ($p = 0.019$). The Good Death Scale scores are shown in Table 6.

Discussion

Among patients with advanced cancer at their end of life, 8.2% of patients developed malignant wounds. Malignant wounds were more common in female and young people, probably due to the high prevalence of breast cancer. Multivariate analysis also showed that malignant wounds were significantly more common in females. Patients with malignant wounds frequently required antidepressants, which might be associated with psychological distress due to malignant wounds. Patients with malignant wounds had higher IPOS-feeling at peace scores, suggesting higher psychological distress, which was associated with moderate to severe IPOS-pain and the frequency of dressing changes due to exudate and bleeding.

Patients with malignant wounds had higher IPOS-pain scores and required higher doses of opioids. This suggests that they have more pain than patients without malignant wounds. At the same time, they did not have higher Pain NRS than patients without malignant wounds. Pain NRS is a score to evaluate pain by the patients themselves. IPOS is a scale where health-care professionals rate the patient's symptoms. Discrepancies between the health-care professionals' assessment and the patient's complaints of pain might exist. A previous report showed that there was no significant correlation between Pain NRS and IPOS (Amano et al. 2021). The influence of opioids also cannot be ignored. Pain NRS for patients whose pain is controlled by high-dose opioids may be underestimated when compared to the IPOS-pain score, which is rated by health-care professionals.

Patients with malignant wounds tended to have higher IPOS-feeling at peace scores and IPOS-pain scores, however, not significantly. Presence of confounding variables were suspected. Breast cancer accounts for the majority of patients with malignant wounds. Many breast cancer patients have reported that they often experience multiple concurrent psychological symptom burden due to major changes in appearance by cancer development and mastectomy (Guimond et al. 2020; Izydorczyk et al. 2018), which

Table 5. The factors affecting psychological symptoms for patients with MWs

IPOS-feeling at peace score	0–1 (<i>n</i> = 85)	2–4 (<i>n</i> = 64)	Total (<i>n</i> = 149)	<i>p</i>
MW at face				
Yes (%)	14 (16.5)	14 (21.9)	28 (18.8)	0.41
No (%)	71 (83.5)	50 (78.1)	121 (81.2)	
Condition				
Reddening or skin defects (%)	47 (55.3)	33 (51.6)	80 (53.7)	0.74
Necrosis or fistula (%)	38 (44.7)	31 (48.4)	69 (46.3)	
Bleeding				
Yes (%)	24 (28.2)	18 (28.1)	42 (28.2)	1.0
No (%)	61 (71.8)	46 (71.9)	107 (71.8)	
Exudate				
Yes (%)	44 (51.8)	31 (48.4)	75 (50.3)	0.74
No (%)	41 (48.2)	33 (51.6)	74 (49.7)	
Odor				
Yes (%)	18 (21.2)	10 (15.6)	28 (18.8)	0.53
No (%)	67 (78.8)	54 (84.4)	121 (81.2)	
Itching				
Yes (%)	3 (3.5)	4 (6.3)	7 (4.7)	0.46
No (%)	82 (96.5)	60 (93.8)	142 (95.3)	
IPOS-pain				
0–1 (%)	53 (62.4)	26 (40.6)	79 (53.0)	0.008
2–4 (%)	31 (36.5)	38 (59.4)	69 (46.3)	
Missing (%)	1 (1.2)	0	1 (0.7)	
OMEDD, mean (range), in mg	95.0 (0.5–1200)	77.9 (5–720)	86.5 (0.5–1200)	0.54
Antidepressant use				
Yes (%)	8 (9.4)	4 (6.3)	12 (8.1)	0.56
No (%)	77 (90.6)	60 (93.8)	137 (92.0)	
Frequency of dressing change per day				
≤Once a day (%)	73 (85.9)	44 (68.8)	117 (78.5)	0.015
≥Twice a day (%)	12 (14.1)	20 (31.3)	32 (21.5)	
Number of symptoms				
0–1 (%)	58 (68.2)	48 (75.0)	106 (71.1)	0.47
2–4 (%)	27 (31.8)	16 (25.0)	43 (28.9)	

IPOS: Integrated Palliative Care Outcome Scale; MW: malignant wound, OMEDD: oral morphine equivalent daily dose.

might result in higher IPOS-feeling at peace scores and IPOS-pain scores.

Psychological distress was associated with the frequency of dressing changes. Malignant wounds which need frequent dressing changes are advanced and cause many physical symptoms,

Table 6. Good Death Scale scores for the patients with and without MWs

Good Death Scale scores	Patients with MWs (n = 156)	Patients without MWs (n = 1740)	Total (n = 1896)	p
Awareness, mean	2.46	2.43	2.43	0.61
Acceptance, mean	2.27	2.21	2.22	0.35
Propriety, mean	2.74	2.56	2.58	0.019
Timeliness, mean	2.48	2.29	2.31	0.068
Comfort, mean	2.02	2.14	2.13	0.13
Total score, mean	12.12	11.94	11.95	0.48

MW: malignant wound.

which adds to the psychological distress. In addition to physical symptoms due to malignant wounds, the procedure of dressing changes itself can contribute to psychological distress for them because of the pain due to the procedure and the time it takes. Patients may feel apologetic toward the caregiver as they have to burden them with changing the dressing. Through the procedure of dressing changes, patients might realize that their body is breaking down, which thus, might lead to psychological distress.

To maintain their QOL, adequate pain control and less uncomfortable dressing changes will be required. Also, health-care providers need to understand that patients suffer from psychological distress by these factors.

The presence of malignant wounds did not affect the quality of death. Only the “propriety” score was significantly higher among patients with malignant wounds than patients without malignant wounds, meaning that the wishes of patients with malignant wounds and their families were more respected. Patients with malignant wounds had more opportunities to undergo procedures and might feel that their wishes were respected. On the other hand, the presence of malignant wounds did not affect the Good Death Scale total score. The quality of death is determined by numerous factors that influence its judgment, including culture, type and stage of disease, and social and professional roles in the dying experience (Hales *et al.* 2008). Therefore, the presence of malignant wounds alone might not affect the QOL total score.

This study has several strengths. First, this is a large, prospective, and multicenter study. While a previous report included 67 patients with malignant wounds (Maida *et al.* 2009), we included more than 150 patients with malignant wounds, out of nearly 2000 patients with cancer. Additionally, a range of information was obtained, including clinical characteristics, medications, symptom burden, and the malignant wound status. Finally, the large number of data obtained and the small number of missing data provide a high degree of generalizability.

This study has several limitations. This is a post hoc analysis of a prospective cohort, and all data were obtained from Japanese patients in PCUs. Although this study showed the relationship between pain and psychological distress in patients with malignant wounds, this relationship may not be limited to patients with malignant wounds. The psychological distress of non-end-of-life population with malignant wounds may be different. In addition, patients’ feelings may have been impacted by the negative

emotion experienced during admission to PCUs, and thus, the evaluation may not be accurate. Feelings and symptoms that could have changed after hospitalization were not evaluated. Moreover, IPOS and Good Death Scale were evaluated by health-care professionals and not based on patient-reported outcomes. Although the validity of a proxy evaluation has been reported (Cheng *et al.* 2013; Murtagh *et al.* 2019), the results of the present study should be interpreted with caution. Studies based on data on patient-reported outcomes are necessary. At the same time, evaluating the symptom of patients at end of life using the patient-reported outcomes are limited because of their poor general condition and the difficulty of accurately describing their own symptom burden.

Therefore, despite the limitations, this study is a worthy report, which showed the psychological impact of malignant wounds on patients.

Conclusions

This study showed that patients at their end of life suffer from psychological distress due to malignant wounds. Psychological distress was associated with moderate to severe IPOS-pain and the frequency of dressing changes. Adequate pain control and less uncomfortable dressing changes will be required. Patients with malignant wounds require psychological support in addition to the treatment of physical symptoms for maintaining their QOL. Also, health-care providers need to understand their psychological symptom burden.

Acknowledgments. We thank all the patients whose data were used for the study. Editage (Cactus Communications) provided editorial support in the form of medical writing, table assembly, collating author comments, copyediting, fact-checking, and referencing based on the authors’ detailed directions.

Funding. The present study was supported in part by a grant-in-aid from the Japan Hospice Palliative Care Foundation.

Competing interests. Dr. Ishiki reports personal fees from Mundipharma, DaiichiSankyo, Shionogi, and EA Pharma outside of the submitted work. All other authors state that they have no conflict of interest.

References

- Alexander S (2009) Malignant fungating wounds: Epidemiology, aetiology, presentation and assessment. *Journal of Wound Care* 18(7), 273–274, 276–278, 280. doi:10.12968/jowc.2009.18.7.43110
- Amano K, Ishiki H, Miura T, *et al.* (2021) C-Reactive protein and its relationship with pain in patients with advanced cancer cachexia: Secondary cross-sectional analysis of a multicenter prospective cohort study. *Palliative Medicine Reports* 2(1), 122–131. doi:10.1089/pmr.2021.0004
- Beers EH (2019) Palliative wound care: Less is more. *Surgical Clinics of North America* 99(5), 899–919. doi:10.1016/j.suc.2019.06.008
- Cheng SY, Dy S, Huan SB, *et al.* (2013) Comparison of proxy ratings of main family caregivers and physicians on the quality of dying of terminally ill cancer patients. *Japanese Journal of Clinical Oncology* 43(8), 795–804. doi:10.1093/jjco/hyt085
- Guimond AJ, Ivers H and Savard J (2020) Clusters of psychological symptoms in breast cancer: Is there a common psychological mechanism? *Cancer Nursing* 43(5), 343–353. doi:10.1097/NCC.0000000000000705
- Hales S, Zimmermann C and Rodin G (2008) The quality of dying and death. *Archives of Internal Medicine* 168(9), 912–918. doi:10.1001/archinte.168.9.912
- Hearn J and Higginson IJ (1999) Development and validation of a core outcome measure for palliative care: The palliative care outcome scale. Palliative Care Core Audit Project Advisory Group. *Quality & Safety in Health Care* 8(4), 219–227. doi:10.1136/qshc.8.4.219

- Higashibata T, Hamano J, Hisanaga T, et al.** (2022) Does urinary catheterization affect the quality of death in patients with advanced Cancer? A secondary analysis of a multicenter prospective cohort study. *Journal of Palliative Medicine* **25**(2), 205–212. doi:10.1089/jpm.2021.0178
- Hiratsuka Y, Yamaguchi T, Maeda I, et al.** (2020) The Functional Palliative Prognostic Index: A scoring system for functional prognostication of patients with advanced cancer. *Supportive Care in Cancer* **28**(12), 6067–6074. doi:10.1007/s00520-020-05408-x
- Izydorczyk B, Kwapniewska A, Lizinczyk S, et al.** (2018) Psychological resilience as a protective factor for the body image in post-mastectomy women with breast cancer. *International Journal of Environmental Research and Public Health* **15**(6), 1181. doi:10.3390/ijerph15061181
- Kodama M, Kobayashi M, Katayama K, et al.** (2017) Development and linguistic validation of the Japanese version of the Good Death Scale. *Palliative Care Research* **12**, 311–316. doi:10.2512/jspm.12.311
- Maida V, Ennis M, Kuziemy C, et al.** (2009) Symptoms associated with malignant wounds: A prospective case series. *Journal of Pain and Symptom Management* **37**(2), 206–211. doi:10.1016/j.jpainsymman.2008.01.009
- Murtagh FE, Ramsenthaler C, Firth A, et al.** (2019) A brief, patient- and proxy-reported outcome measure in advanced illness: Validity, reliability and responsiveness of the Integrated Palliative care Outcome Scale (IPOS). *Palliative Medicine* **33**(8), 1045–1057. doi:10.1177/0269216319854264
- O'Brien C** (2012) Malignant wounds: Managing odour. *Canadian Family Physician* **58**(3), 272–274; e141–e273.
- Tewes M, Baumann F, Teufel M, et al.** (2021) Symptoms during outpatient cancer treatment and options for their management. *Deutsches Ärzteblatt International* **118**(17), 291–297. doi:10.3238/arztebl.m2021.0028
- Tilley C, Lipson J and Ramos M** (2016) Palliative wound care for malignant fungating wounds: Holistic considerations at end-of-life. *Nursing Clinics of North America* **51**(3), 513–531. doi:10.1016/j.cnur.2016.05.006
- Tsichlakidou A, Govina O, Vasilopoulos G, et al.** (2019) Intervention for symptom management in patients with malignant fungating wounds – A systematic review. *Journal of B.U.ON* **24**(3), 1301–1308.