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Letter to the Editor

Utilization Trends of Palliative Interventional Radiology in Japan: Analysis of National Health Insurance Claims Data and the Need for Collaborative Awareness Among Radiology Specialists

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Abstract

Cancer causes distressing symptoms that significantly compromise the quality of life, highlighting the importance of palliative care along with anticancer treatments. In Japan, a national guideline for basic palliative care training was introduced in 2018 to promote basic palliative care skills among healthcare professionals; however, a substantial proportion of patients with cancer continue to experience pain or physical distress at the end of life. Specialized palliative interventions, including palliative interventional radiology (IR), are important for treating symptoms that are refractory to basic palliative care. Although prospective multi-institutional clinical trials have demonstrated the efficacy of palliative IR in Japan, its real-world application remains unclear. Therefore, this study analyzed open-access data from the National Database of Health Insurance Claims between fiscal years 2015 and 2022 and examined the annual procedure volumes and temporal trends of representative palliative IR procedures. Percutaneous vertebroplasty was the most frequently performed procedure and showed a marked increase over time, whereas the volumes of several other palliative IR procedures declined. Since insurance claim codes for these procedures are shared between malignant and non-malignant indications, the utilization of palliative IR for patients with cancer may have been overestimated in the present data. Considering the increasing number of patients with cancer in Japan, the utilization rate of palliative IR among patients who may benefit from these procedures is likely to be even lower. Despite accumulating evidence and minimal invasiveness, palliative IR appears to be underutilized, indicating that the recognition of palliative IR indications and collaboration among all radiology specialists across subspecialties is essential to seamlessly adapt palliative IR into daily clinical practice.

Keywords

Palliative interventional radiology, Interventional oncology, Cancer-related-symptom, Database analysis

Conflict of Interest: All authors declare that they have no conflicts of interest to report.

Dear Editor,

Cancer often causes distressing symptoms, including pain, luminal or vascular stenosis, and pleural or abdominal effusion, which can significantly compromise quality of life. Therefore, palliative care aimed at alleviating cancer-related symptoms should be provided along with life-prolonging anticancer treatments. In Japan, the Ministry of Health, Labour and Welfare issued national guidelines for basic palliative care training programs in 2018[1]. The

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Table 1 Utilization number of palliative interventional radiology by fiscal year

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Percutaneous vertebroplasty	5,693	7,160	8,977	10,339	10,942	12,359	14,442	15,367
Celiac plexus block	514	563	534	430	416	420	357	361
Peritoneo-venous shunt	487	497	499	433	439	462	420	346
Percutaneous trans-esophageal gastro-tubing	981	948	945	848	756	717	638	616
Tracheal stent	623	591	573	554	617	522	536	489
Esophageal stent	3,744	3,695	3,613	3,672	3,468	3,691	3,363	3,255

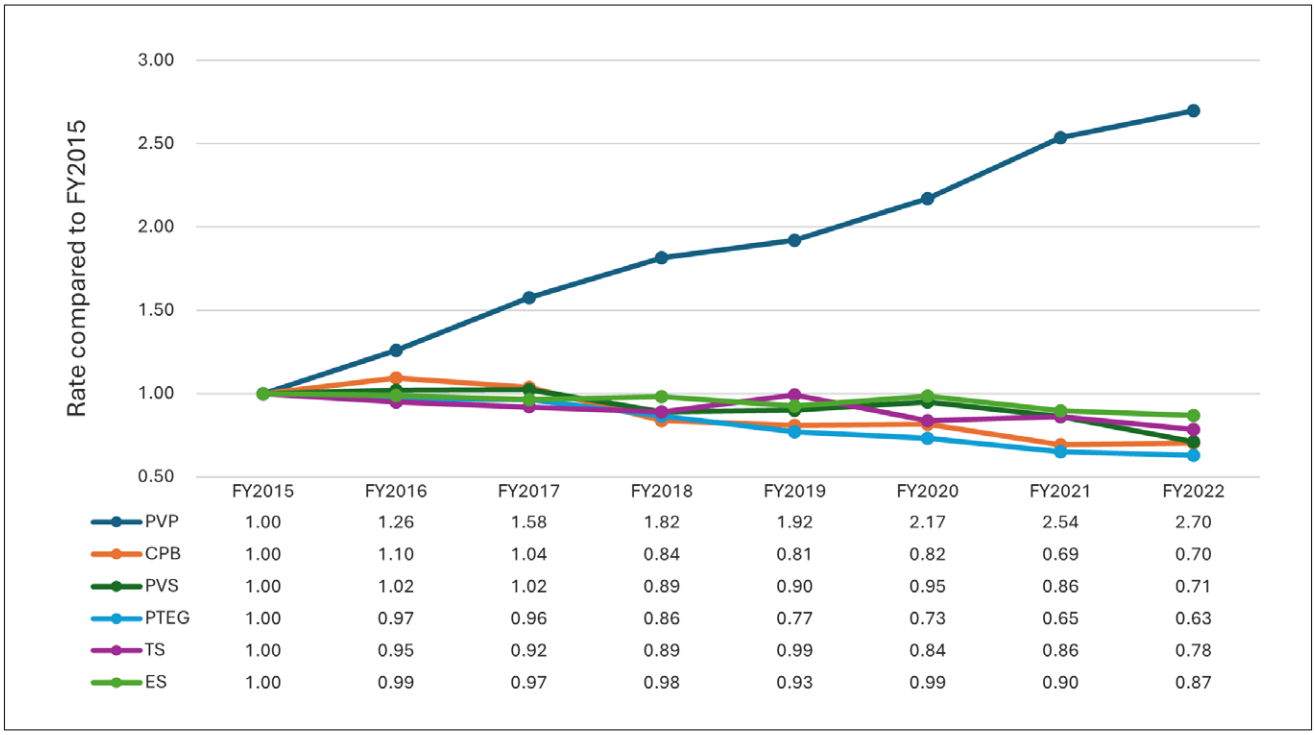
FY, fiscal year

guidelines aim to ensure that all healthcare professionals involved in cancer care acquire a fundamental understanding of basic palliative care, the necessary knowledge, skills, and professional attitudes required to provide appropriate basic palliative care. Based on these guidelines, basic palliative care training programs were implemented in each prefecture. Nevertheless, approximately 40% of patients with cancer experienced pain or physical distress during the last month of life, according to a bereaved family survey[2]. Specialized palliative care provided by multidisciplinary palliative care specialists is required for patients with pain and physical distress refractory to basic palliative care. In specialized palliative care, radiology specialists play an important role by contributing to accurate imaging-based diagnoses of the underlying causes of symptoms and providing palliative treatment, including palliative radiotherapy and palliative interventional radiology (IR).

Although prospective multi-institutional clinical trials of palliative IR have been conducted in Japan in recent years with accumulated evidence supporting its efficacy, whether this growing evidence has translated into increased utilization of palliative IR in clinical practice, as well as utilization trends, has not been well analyzed[3]. Therefore, this issue was retrospectively analyzed using open data from the National Database (NDB) of Health Insurance Claims in Japan[4].

Open data between fiscal years (FY) 2015 and FY2022 were obtained from the official website of the Ministry of Health, Labour and Welfare in Japan[4]. The numbers of palliative IR procedures, including percutaneous vertebroplasty (PVP), celiac plexus block (CPB), peritoneovenous shunt (PVS), percutaneous transesophageal gastrotubing (PTEG), tracheal stent placement (TS), and esophageal stent placement (ES), were obtained from the database. Other palliative IR procedures, such as transcatheter embolization or radiofrequency ablation for painful bone metastases and stent placement for malignant vena cava syndrome, could not be evaluated because of the lack of specific insurance claims codes. In Japan, PVP, CPB, PVS, PTEG, TS, and ES are reimbursed for both malignant and non-malignant conditions (i.e., PVP can be provided for both vertebral metastases and osteoporosis). Because the same insurance claims codes were used for both malignant and non-malignant indications, it was not possible to distinguish procedures performed for cancer from those for non-malignant conditions.

Table 1 shows the utilization numbers, and Fig.1 shows the trends of each palliative IR by FY. The most frequently performed procedure was PVP, with an increasing trend from FY2015 to FY2022 (2.7-fold increase). In contrast, the relative utilization rates of the other five procedures decreased to 0.63-0.87 of FY2015 levels. Because these procedure counts included both malignant and non-malignant conditions, the actual number of procedures performed for patients with cancer may be lower than that suggested by the present data, which included patients with non-malignant conditions. Furthermore, if the counts of these procedures are interpreted in the context of the increasing number of patients with cancer in Japan, the utilization rate of these indicated procedures among patients with cancer would be expected to be even lower. Therefore, the observed downward trend in certain palliative IR procedures is



	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
PVP	1.00	1.26	1.58	1.82	1.92	2.17	2.54	2.70
CPB	1.00	1.10	1.04	0.84	0.81	0.82	0.69	0.70
PVS	1.00	1.02	1.02	0.89	0.90	0.95	0.86	0.71
PTEG	1.00	0.97	0.96	0.86	0.77	0.73	0.65	0.63
TS	1.00	0.95	0.92	0.89	0.99	0.84	0.86	0.78
ES	1.00	0.99	0.97	0.98	0.93	0.99	0.90	0.87

Fig.1 Trends of each procedure with an indicating rate compared to fiscal year (FY) 2015.
The utilization of PVP continued to rise and was 2.7 times higher in FY2022 than in FY2015. The other procedures, including CPB, PVS, PTEG, TS, and ES, tended to decrease and were 0.63–0.87 lower in FY2022 than in FY2015.
PVP: percutaneous vertebroplasty, CPB: celiac plexus block, PVS: peritoneovenous shunt, PTEG: percutaneous transesophageal gastrotubing, TS: tracheal stent, ES: esophageal stent

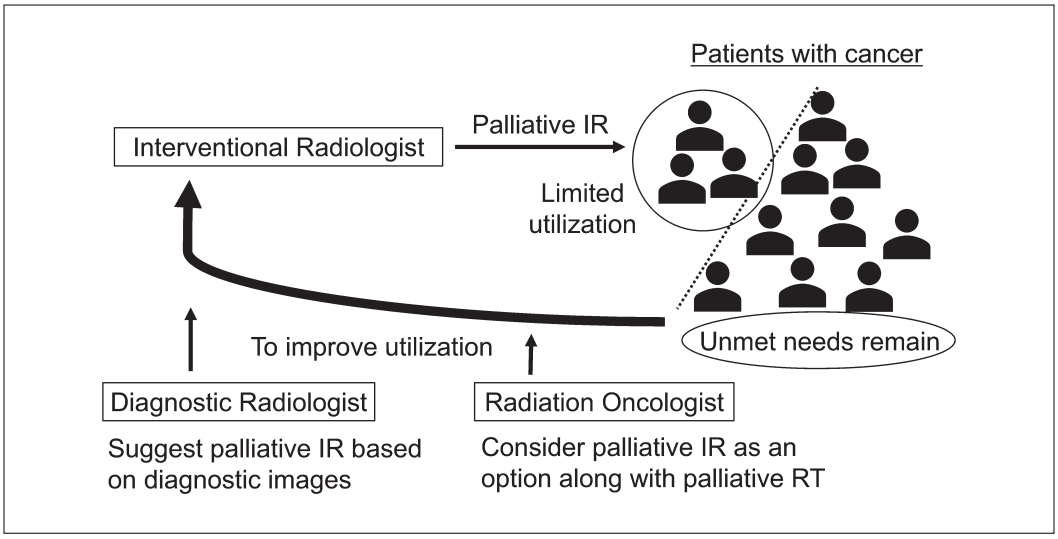


Fig.2 The problem of limited utilization of palliative interventional radiology and the needs of collaboration among radiology specialists.
In Japan, palliative interventional radiology (IR) is provided to a limited number of patients with cancer, and unmet needs of the therapy remain. To improve the utilization of palliative IR, collaborative awareness among all radiology specialists is essential, including the suggestion of palliative IR based on diagnostic images by diagnostic radiologists, and considering palliative IR as a treatment option along with palliative radiotherapy by radiation oncologists.
IR: Interventional Radiology, RT: Radiotherapy

notable, and may reflect the underutilization of palliative IR in clinical practice in Japan.

Despite being minimally invasive, not requiring expensive medical equipment, and the growing clinical evidence for palliative IR, the broader adoption of palliative IR may be hindered by limited awareness and lack of well-trained palliative IR specialists[3,5,6]. Given the accumulating evidence and potential benefits for patients with cancer-related symptoms, increasing awareness of palliative IR is crucial. Non-radiation oncology healthcare professionals may not always recognize the indications for palliative radiotherapy, which leads to its underutilization; this highlights the importance of increasing awareness of its indications among non-radiation oncology healthcare professionals[7-9]. To increase the awareness of palliative IR, the collaboration among all radiology specialists spanning their respective subspecialties is important and effective **(Fig.2)**. Diagnostic radiologists can play a crucial role by including suggestions for palliative IR in their diagnostic reports or by consulting IR specialists when palliative IR may be appropriate based on diagnostic images. Radiation oncologists who are consulted for palliative radiotherapy can contribute by considering and suggesting palliative IR as a treatment option to the primary physician in charge when applicable. Furthermore, as a result of raising awareness, increasing consultations of palliative IR to IR specialists will naturally contribute to solving the issue of a lack of well-trained palliative IR specialists by providing them with opportunities to gain experience and boost their motivation to perform palliative IR procedures, leading to a positive cycle that supports the wider adoption of palliative IR. The present data have several limitations related to the Japanese insurance claims system, including the inability to evaluate some palliative IR procedures and the inclusion of both malignant and non-malignant conditions in the six analyzed procedures. Therefore, the present data do not directly demonstrate the overall underutilization of palliative IR among patients with cancer. Nevertheless, given the effectiveness of palliative IR and the increasing number of patients with cancer in Japan, these findings may indicate a potential unmet need for palliative IR in clinical practice. Recognition of palliative IR indications and collaboration among all radiology specialists across subspecialties are essential to seamlessly adapt palliative IR into daily clinical practice.

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