

ENDOVASCULAR THERAPY FOR PALLIATIVE CARE OF CANCER PATIENTS

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Abstract

Endovascular therapy (EVT) has emerged as a minimally invasive approach to manage various complications associated with advanced malignancies. In palliative care, the primary goal is to alleviate symptoms, improve quality of life, and minimize procedural burden. This review discusses the role of endovascular interventions—including embolization, stenting, and catheter-based therapies—in the palliative management of cancer patients.

Keywords: Palliative care, endovascular therapy, interventional radiology.

Introduction

Cancer progression often leads to complex clinical scenarios, including hemorrhage, vascular obstruction, and severe pain, making symptom control a primary goal in palliative care rather than curative treatment [1-4]. Endovascular therapy offers effective solutions with reduced morbidity compared to open surgical techniques, making it highly suitable for patients with limited life expectancy [5-7]. In palliative oncology, the main indications for endovascular therapy include the control of bleeding through embolization of tumor-related hemorrhages, such as gastrointestinal, bronchial, or pelvic bleeding, as well as the relief of vascular obstructions by stenting in conditions like superior vena cava syndrome, biliary obstruction, or iliac vein compression [8-10]. Additionally, endovascular approaches are utilized for pain management by targeting hypervascular tumors such as renal cell carcinoma or hepatocellular carcinoma, and for managing ascites and pleural effusion through catheter-based drainage and pleurodesis interventions [11-14]. Techniques commonly employed in these settings include transarterial embolization (TAE), which occludes the blood supply to tumors or bleeding vessels using particles, coils, or glue; endovascular stenting, involving the placement of self-expandable metal stents in cases of malignant strictures; and percutaneous drainage, a minimally invasive method used to manage fluid collections associated with malignancies [15-18].

Endovascular therapy provides several benefits, such as reduced hospital stays, faster recovery times, lower procedural risks compared to traditional surgery, and effective symptom palliation, all of which contribute to improving the patients' comfort and quality of life [20-25]. However, certain limitations exist, including the risk of procedure-related complications like ischemia or infection, the potential need for repeated interventions due to temporary symptom relief, and the fact that these treatments are not curative but aim purely to enhance quality of life [26-29].





Materials and Methods

This retrospective observational study was conducted at a tertiary cancer care center between January 2020 and December 2024. Cancer patients who underwent endovascular procedures with purely palliative intent were included. Eligibility was based on a confirmed diagnosis of malignancy, presence of symptoms such as bleeding, vascular obstruction, or severe pain requiring endovascular management, and availability of complete clinical data. Patients who had undergone interventions with curative intent or had incomplete medical records were excluded from the study. Various endovascular techniques were used depending on the clinical presentation, including arterial embolization for hemorrhage control or tumor devascularization, venous stenting for symptomatic relief of superior vena cava syndrome or iliac vein compression, and ablative procedures such as radiofrequency or microwave ablation for tumor-related pain [30-32]. In some cases, combined interventions were performed during a single session. All procedures were performed under fluoroscopic guidance using standard interventional radiology protocols, with local anesthesia or conscious sedation administered as appropriate. Post-procedural monitoring included clinical follow-up, imaging, and symptom assessment.

Patient data, including age, sex, cancer type, indication for intervention, type of endovascular procedure, and immediate and short-term outcomes, were extracted from hospital records. Symptom relief was assessed by comparing pain levels and bleeding control pre- and post-intervention, and quality of life was evaluated where possible using the EORTC QLQ-C30 questionnaire. Statistical analysis was conducted using SPSS version 25.0, with descriptive statistics summarized as means, standard deviations, and percentages. Comparisons of pre- and post-treatment symptom scores were made using paired t-tests, with significance set at a p-value of <0.05.

Results

A total of 87 cancer patients underwent endovascular procedures with palliative intent during the study period. The patient population had a mean age of 61.4 years, with a slight predominance of males (54%). The most common primary malignancies were gastrointestinal (32%), lung (21%), genitourinary (18%), and gynecologic cancers (14%). The most frequent indications for intervention included tumor-related hemorrhage (48%), venous obstruction syndromes (29%), and intractable pain due to hypervascular tumors (23%).

Arterial embolization was the most commonly performed procedure (48%), followed by venous stenting (29%), ablative therapies (11%), and combined interventions (12%). Technical success was achieved in 96% of cases, defined as successful catheterization and completion of the intended procedure without intra-procedural complications [33-35]. Clinical symptom relief was observed in 81% of patients within 72 hours post-intervention. Among patients who underwent embolization for active bleeding, immediate hemostasis was achieved in 88%, with no major rebleeding events within the first week. Venous stenting provided rapid symptom improvement, particularly in cases of superior vena cava syndrome, where 90% of patients reported relief in dyspnea and facial swelling within 48 hours.

Pain scores, measured using a standard numeric rating scale, showed a statistically significant reduction from a mean of 7.6 ± 1.4 before intervention to 3.2 ± 1.1 post-procedure ($p < 0.001$).





Quality-of-life assessments, available in a subset of 39 patients, indicated moderate to marked improvement in physical function and symptom burden one week after the intervention, as measured by the EORTC QLQ-C30. Procedure-related complications were minimal, with minor adverse events such as transient fever or localized pain reported in 9% of cases. No major complications or procedure-related mortalities occurred.

Discussion

The findings of this study reinforce the clinical value of endovascular therapy (EVT) as a palliative modality for cancer patients experiencing symptoms such as hemorrhage, venous obstruction, and intractable pain. The high rate of technical success (96%) and significant symptom relief observed in this patient population underscore the feasibility and effectiveness of minimally invasive endovascular approaches in palliative settings. In particular, embolization procedures provided prompt and durable control of bleeding, which is often a life-threatening and distressing symptom in advanced cancer. Similarly, venous stenting offered rapid decompression of obstructed vessels, leading to noticeable improvement in quality of life with minimal delay. These outcomes are consistent with previous reports in the literature that support EVT as a valuable alternative to open surgical interventions, which may be too invasive or risky for patients with limited life expectancy. The reduction in pain scores and the positive impact on functional status as reflected in EORTC QLQ-C30 scores suggest that EVT not only addresses immediate clinical concerns but also contributes to overall well-being. Furthermore, the low incidence of complications highlights the safety of these procedures when performed in experienced hands. Nevertheless, this study has certain limitations, including its retrospective design, relatively small sample size, and lack of long-term follow-up data. Future prospective, multicenter studies are necessary to validate these findings and establish standardized protocols for patient selection and procedural techniques in palliative EVT.

Conclusion

Endovascular therapy offers a safe, effective, and minimally invasive option for the palliation of symptoms in cancer patients. It provides rapid relief of distressing conditions such as bleeding, venous obstruction, and pain, thereby significantly improving patients' comfort and quality of life. Given its low complication rates and high clinical success, EVT should be considered a key component of multidisciplinary palliative care strategies. As technology and expertise continue to evolve, the role of endovascular interventions in oncologic palliation is likely to expand further, offering new hope for symptom control in advanced malignancy.

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