



Original Article

Antithrombotic Therapy for Inferior Vena Cava Stenting of Malignant Inferior Vena Cava Syndrome: A Questionnaire Study of Japan Interventional Radiology Study Group (JIVROSG)

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Abstract

Purpose The aim of this study was to evaluate the differences in antithrombotic therapy policies for inferior vena cava (IVC) stent placement among institutions and interventional radiologists in Japan.

Materials and Methods The cross-sectional online-based questionnaire was conducted between December 2022 and January 2023, and a total of 114 institutions were included in this study. The questionnaire contained eight questions that were grouped into three sections: (1) whether IVC stents have been performed or not, (2) the number of IVC stent placements, and (3) the basic strategy of antithrombotic therapy for pre-, intra-, and post-IVC stent placement.

Results Of the 114 institutions, 38 responses (33%) were collected. Twenty-four of the 38 institutions (63%) had performed IVC stent placement during the study period. The mean number of IVC stent placements during the study period was 3.4 cases per institution. The most frequently selected antithrombotic therapeutic strategies pre-, intra-, and post-stenting were no antithrombotic therapy (62.5%), anticoagulation therapy (54.2%), and no antithrombotic therapy (41.7%).

Conclusion This study has revealed there is no consensus regarding antithrombotic therapy for IVC stent placement in Japan. The results of this study may contribute to our understanding of the status of antithrombotic therapy for IVC stent placement. Future prospective studies are warranted to clarify the periprocedural antithrombotic therapy for IVC stent placement.

Keywords

- ► malignant IVC syndrome
- inferior vena cava stent
- ► anticoagulation therapy

Introduction

Inferior vena cava (IVC) stent placement for malignant IVC syndrome is highly feasible and effective. 1-6 Although some studies have presented evidence for antithrombotic therapy after arterial stenting, including that of coronary arteries,^{7,8} the necessity of antithrombotic therapy for IVC stent placement remains controversial. In addition, the selection and

duration of antithrombotic therapy is not standardized and are determined based on both the experience of interventional radiologists and the policies of individual institutions. Unnecessary antithrombotic therapy should be avoided, especially in patients with cancer who are prone to coagulation abnormalities. Therefore, the lack of a standardized antithrombotic therapy policy for IVC stent placement is undesirable.

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- Whether IVC stent placements have been performed since October 2019 (after the insurance coverage of IVC stent in our country). If no IVC stent placement was performed during the period, subsequent questions could be omitted.
- 2) Please indicate the number of IVC stent placement from October to December 2019.
- 3) Please indicate the number of IVC stent placement from January to December 2020.
- 4) Please indicate the number of IVC stent placement from January to December 2021.
- 5) Please indicate the number of IVC stent placement from January to December 2022.
- 6) Please select the basic strategy of antithrombotic therapy for pre-IVC stent placement from the following four categories.
 - i. No antithrombotic therapy
- ii. Anticoagulation therapy
- iii. Antiplatelet therapy
- iv. Combination of antiplatelet and anticoagulation therapy
- Please select the basic strategy of antithrombotic therapy for intra-IVC stent placement from the four categories listed in question no.6.
- Please select the basic strategy of antithrombotic therapy for post-IVC stent placement from the four categories listed in question no.6.
- **Fig. 1** Questionnaire for Interventional Radiologists on Antithrombotic Therapy for Inferior Vena Cava Stenting of Malignant Inferior Vena Cava Syndrome. IVC, inferior vena cava.

In Japan, IVC stents were covered by insurance in 2019 after many years of off-label use. As a result, the number of cases has increased and is expected to increase further in the future; however, the status of antithrombotic therapy in clinical practice remains unclear.

This study aimed to assess the current status of antithrombotic therapy for IVC stent placement and identify the differences in antithrombotic therapy policies among institutions and interventional radiologists in Japan.

Materials and Methods

Study Design

This cross-sectional online questionnaire was conducted between December 2022 and January 2023. This study was approved by the local institutional review board (IRB), and the need for informed consent was waived. A total of 114 member institutions of the Japan Interventional Radiology in Oncology Study Group (JIVROSG) were included. JIVROSG is a Japanese multicenter academic organization established in 2002 to conduct clinical trials of interventional radiology in the field of oncology, also known as interventional oncology.

One reminder was sent during the study period, and only a single response was allowed. A questionnaire response was considered complete if the respondent completed all components of each section of the questionnaire.

Questionnaire

This questionnaire contained eight questions that were grouped into three sections: (1) whether IVC stents have been used since October 2019 (after insurance coverage of IVC stents commenced in Japan), (2) the number of IVC stent

placements, and (3) the basic strategy of antithrombotic therapy for IVC stent placement. The details of the questionnaire are shown in **Fig. 1**.

Antithrombotic therapy strategies were classified into the following four categories: (1) no antithrombotic therapy, (2) antiplatelet therapy, (3) anticoagulation therapy, and (4) a combination of antiplatelet and anticoagulation therapy. Answers to the pre-, intra-, and poststenting strategies of antithrombotic therapy based on the four categories were obtained from each institution, and the ratio of each category was calculated.

Results

Of the 114 institutions, 38 responses were collected (a 33% response rate). Twenty-four of the 38 institutions (63%) had performed IVC stent placement during the study period. The total number of IVC stent placements during the study period was 82 (mean: 3.4 cases per institution). For prestenting therapy, no antithrombotic therapy (15/24, 62.5%) was the most commonly selected strategy, followed by anticoagulation therapy (6/24, 25%), a combination of antiplatelet and anticoagulation therapy (2/24, 8.3%), and antiplatelet therapy (1/24, 4.2%). For intrastenting, anticoagulation therapy (13/24, 54.2%) was most frequently selected, followed by no antithrombotic therapy (8/24, 33.3%), antiplatelet therapy (2/24, 8.3%), and a combination of antiplatelet and anticoagulation therapy (1/24, 4.2%). For poststenting, no antithrombotic therapy (10/24, 41.7%) was selected, followed by anticoagulation therapy (7/24, 29.1%), a combination of antiplatelet and anticoagulation therapy (4/24, 16.7%), and antiplatelet therapy (3/24, 12.5%; ► Figs. 2-4).

Discussion

This survey suggests that there is no consensus in Japan regarding antithrombotic therapy for IVC stent placement. The most frequently selected antithrombotic therapeutic strategies pre-, intra-, and poststenting were no antithrombotic therapy (62.5%), anticoagulation therapy (54.2%), and no antithrombotic therapy (41.7%).

A previous retrospective descriptive study reported that 33% of patients with cancer who received IVC stent placement without anticoagulation therapy experienced symptom recurrence during the follow-up period. In contrast, another study reported no significant difference in symptom recurrence rates after IVC stent placement with or without anticoagulation therapy. Furthermore, Arendt et al recently published that there was no difference between patient groups with subtherapeutic and therapeutic anticoagulation in terms of procedure-related complication rates, rates of reintervention, and clinical improvement after nonthrombotic venous stent placement. 10 Thus, there is insufficient evidence regarding the necessity and appropriate use of antithrombotic therapy for IVC stent placement, and further prospective studies are warranted. Based on the results of this study, the type, amount, and duration of antithrombotic therapy should be standardized in further evaluations.



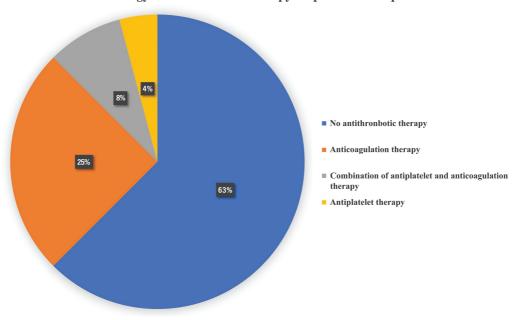


Fig. 2 Pie charts regarding the results of question 6 in questionnaire. IVC, inferior vena cava.

This study had several limitations. First, the study was conducted on a limited number of institutions in a single country. Second, not all of institutions that responded to the questionnaire performed IVC stent placement. In addition, the type, amount, and duration of antithrombotic therapy were not described in detail.

In conclusion, the use of antithrombotic therapy for IVC stent placement varies widely among institutions and interventional radiologists in Japan. The results of this study contribute to our understanding of the current status of

antithrombotic therapy for IVC stent placement. Future research is warranted to clarify specific clinical situations that require periprocedural antithrombotic therapy and determine the optimal strategy.

Ethical Approval Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later

Basic strategy of antithrombotic therapy for intra-IVC stent placement

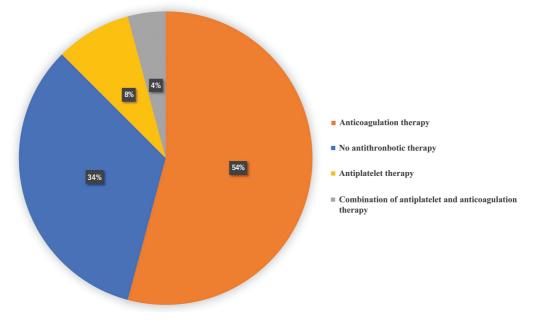


Fig. 3 Pie charts regarding the results of question 7 in questionnaire. IVC, inferior vena cava.

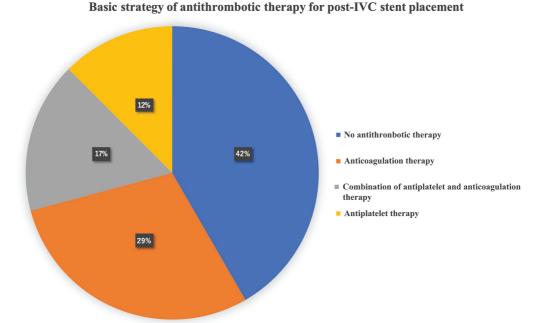


Fig. 4 Pie charts regarding the results of question 8 in questionnaire. IVC, inferior vena cava.

amendments or comparable ethical standards. For this type of study, formal consent is not required. This retrospective study was approved by the Institutional Ethics Committee (approval number: NCCH-2018–049).

Data Availability Statement

All the data published within this article will be made available by the corresponding author, upon reasonable request. We take full responsibility for the data, analyses, interpretation, and research conduct. We have full access to all data and have obtained the rights to publish these results.

Authors' Contribution

All authors made substantial contributions to the study concept or the data analysis or interpretation, drafted the manuscript or revised it critically for important intellectual content, approved the final version of the manuscript to be published, and agreed to be accountable for all aspects of the work.

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Conflict of Interest

None declared.

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