

# Clinical evaluation of retrievable inferior vena cava filters for the prevention of pulmonary thromboembolism

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- PMID: 33856536
- DOI: [10.1007/s00380-021-01856-5](https://doi.org/10.1007/s00380-021-01856-5)

## Abstract

**Background and aims:** Inferior vena cava filters (IVCFs) have been reported to cause chronic complications. Recently, retrievable IVCFs (r-IVCF) have been increasingly used to prevent acute pulmonary thromboembolism (PTE) and allow retrieval upon reduction of PTE risk. However, the outcomes of their use in Japan remain unknown.

**Methods:** This study retrospectively investigated the acute PTE relapse prevention rate, IVCF retrieval attempt rate, retrieval success rate, and long-term prognosis of 197 patients who underwent r-IVCF insertion at our hospital between 2010 and 2018.

**Results:** Subjects had a mean age of 68 years and a male-to-female ratio of 1:1. After r-IVCF insertion, the acute PTE prevention rate was 99.5%. The r-IVCF retrieval rate was 55% (108 patients), with a success rate of 99% (107 patients). r-IVCF retrieval was not attempted in 89 cases due to advanced cancer or poor prognosis (41%), loss to follow-up (32%), and long-term indwelling IVCF (17%). The retrieval group had an average observation period of 36 months, with their anticoagulation therapy continuation, PTE recurrence, and deep vein thrombosis (DVT) recurrence rates being 64%, 3%, and 4%, respectively. The non-retrieval group had a mean observation period of 21 months, with their anticoagulation continuation, PTE recurrence, and DVT recurrence rates being 78%, 3%, and 15%, respectively. DVT recurrence rates increased significantly in the non-retrieval group ( $p < 0.01$ ). Moreover, 65% of all DVTs occurred centrally from the femoral veins, among which 9% were contraindicated for anticoagulation therapy.

**Conclusions:** IVCF placement significantly prevented acute PTE but promoted recurrent DVTs when not retrieved after risk reduction. Hence, to increase recovery rates, IVCFs be promptly removed when no longer necessary.

**Keywords:** Deep vein thrombosis; Inferior vena cava filter; Pulmonary embolism.