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(12) **United States Patent**  
**Mirizzi**

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(54) **METHOD AND APPARATUS FOR STORAGE AND/OR INTRODUCTION OF IMPLANT FOR HOLLOW ANATOMICAL STRUCTURE**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1802 days.

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(65) **Prior Publication Data**

(57) **ABSTRACT**

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Apparatus for advancing a vascular implant into a blood vessel. The apparatus comprises a first elongate member having sufficient column strength to function as a pusher member; and a second elongate member, the second elongate member being thinner than the first elongate member and extending to a distal end located at a first point which is at or near a distal end of the first elongate member. The elongate members form an implant retaining portion while the distal end of the second elongate member is located at the first point. The implant retaining portion is located proximal of the first point. The implant retaining portion comprises a space located between the elongate members and configured for receiving an implant portion, with the first elongate member on one side of the space and the second elongate member on another side. The implant retaining portion further comprises a proximal side and a distal side which further circumscribe the space. The proximal and distal sides are effective to prevent an implant received in the retaining portion from moving out of engagement with the retaining portion as the first elongate member is moved distally and proximally. The implant retaining portion is removable by withdrawing the second elongate member in a proximal direction with respect to the first elongate member, thereby moving the distal end of the elongate member proximally beyond the former location of the implant retaining portion. Associated methods, and other apparatus and methods, are also disclosed.

**Related U.S. Application Data**

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(51) **Int. Cl.**

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*A61B 17/00* (2006.01)

(52) **U.S. Cl.**

CPC ... *A61B 17/12022* (2013.01); *A61B 17/12109* (2013.01); *A61B 17/12181* (2013.01); (Continued)

(58) **Field of Classification Search**

USPC ..... 604/508, 43; 606/159  
See application file for complete search history.

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**26 Claims, 50 Drawing Sheets**

