

## - 가 1

. . 2 . 3 . 3 . 4 . . . . 5

: 가

. 가 .

: 8 4  
2 가 6-7 F

Wallstent  
28%

. 가 .

, 가 .

. : 가 .  
2

. 가 .

. 2, 4, 8  
가

: 가

. 가 .

1944 Geremia (1) . 3 가

가 (4).

가 가 (2), (7), 7 mm  
10 mm  
(3-6).

가 . (8),

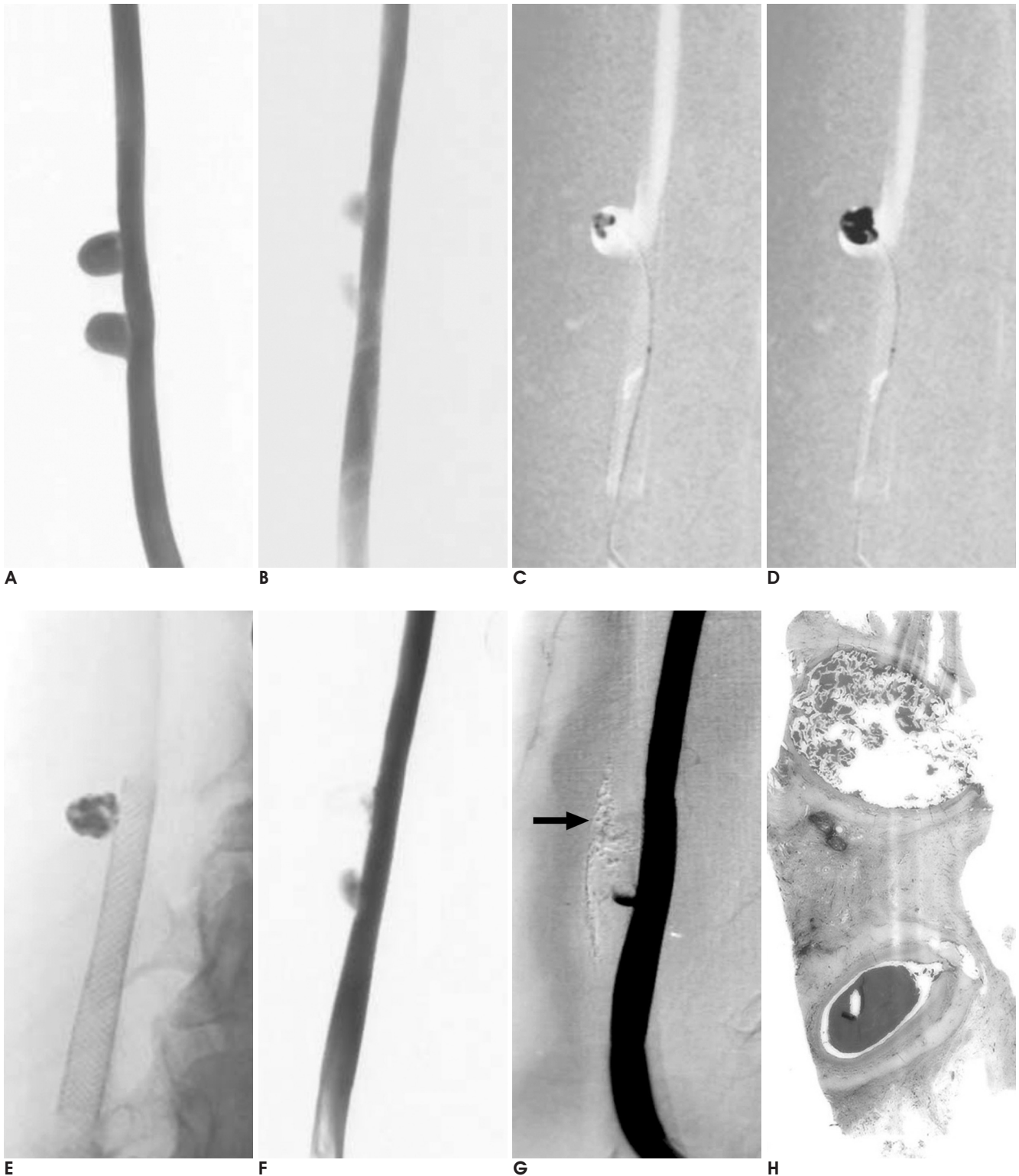
1  
2  
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1998  
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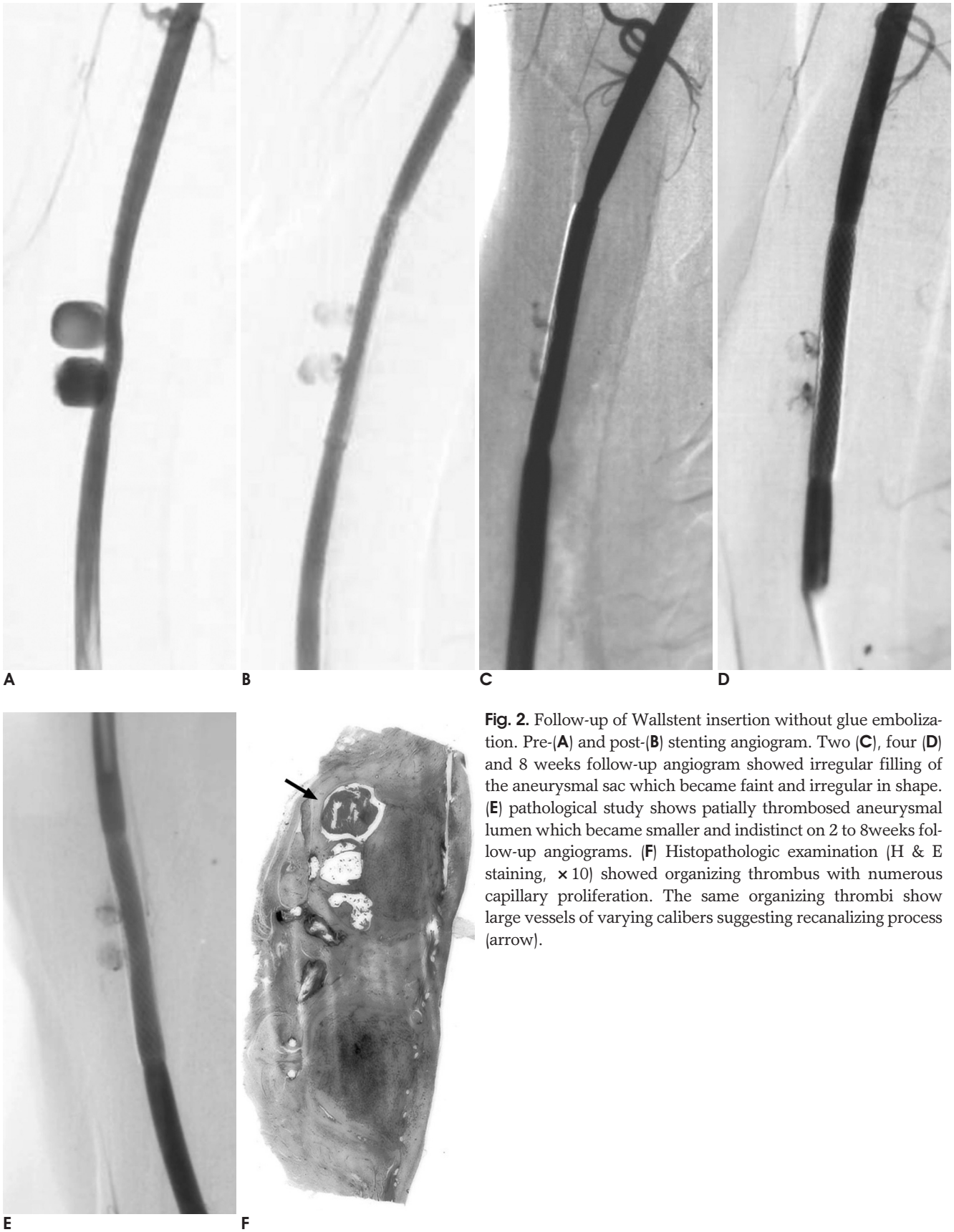
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(9-12).





**Fig. 1.** Glue embolization after Wallstent insertion in surgically constructed canine carotid aneurysm. After obtaining initial angiogram of carotid sidewall aneurysm (**A**), Wallstent was inserted (**B**). Initial (**C**) and late phases (**D**) of glue injection are well demonstrated on the saved roadmap images. The final cast is well abutting the stent wall (**E**). Final (**F**) angiogram showed almost no filling of the aneurysm compared to the lower one which was not embolized. Two weeks follow-up angiogram (**G**) showed obliteration of aneurysm as well as a good patency of the carotid artery. There is a small portion of the lower aneurysm which was not embolized with glue. Note radiopacities of tungsten powder along the outside of aneurismal lumen (arrow). (**H**) Histopathologic examination (H & E staining,  $\times 10$ ) showed organization of the thrombus with ingrowth of fibroblasts in the upper embolized one. Foreign body reaction is focally associated. In contrast, the thrombus remains as fresh state and only thin rim of fibroblasts is observed along the outmost layer of the thrombus in the lower non-embolized one.



**Fig. 2.** Follow-up of Wallstent insertion without glue embolization. Pre-(**A**) and post-(**B**) stenting angiogram. Two (**C**), four (**D**) and 8 weeks follow-up angiogram showed irregular filling of the aneurysmal sac which became faint and irregular in shape. (**E**) pathological study shows patially thrombosed aneurysmal lumen which became smaller and indistinct on 2 to 8weeks follow-up angiograms. (**F**) Histopathologic examination (H & E staining,  $\times 10$ ) showed organizing thrombus with numerous capillary proliferation. The same organizing thrombi show large vessels of varying calibers suggesting recanalizing process (arrow).

Wallstent

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(Fig. 1C, D). 2

1 27

2 10

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(Fig. 1E).

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. Cognard (8)

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3

2

3

가

2

4

2

Cognad

(Fig. 1).

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가

가

1

2

, 4 , 8

copolymer) DMSO

EVAL (Ethylene vinyl

(Fig. 2).

가

(9). Cellulose acetate polymer

(10, 12)

가

(10 - 12). Kinugasa

2

cellulose acetate polymer (CAP)

6

CAP

, 10

(fibrocyte)

(12). Sugiu

(10) CAP

1 - 4

16

3

, 5

(Fig. 1H).

가

. Schmitz - Rode

(Fig. (14)

2F).

(ethibloc hydrogel)

가

가

28%

72%

가

(3 - 6).

가

(15).

가

가

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## Glue Embolization of Aneurysm after Stenting in Canine Carotid Arteries - Technical Feasibility<sup>1</sup>

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**Purpose:** Coiling or infusion of embolic materials into a wide necked aneurysm can be performed with stenting. The purpose of our study is to assess the technical feasibility of aneurysm treatment with glue embolization after stenting.

**Materials and Methods:** We used four Wallstents for surgically repairing eight canine carotid aneurysms. After confirmation of the aneurysms on the angiogram, we introduced a 6 - 7 F guiding catheter in order to deploy the stents. After stenting, we passed a microcatheter into the aneurysm lumen through the stent mesh. 28% glue was slowly injected until the glue cast completely filled the lumen. We evaluated the passage of a microcatheter through the stent meshwork, formation of the glue cast and the stents' ability to protection for any leakage of glue. The follow-up angiogram was obtained for two dogs, one to three times until 8 weeks, and then we sacrificed the dogs and performed pathologic examinations.

**Results:** Stenting was successful in all cases except one in which the vessel was occluded because the stent was not completely expanded within the lumen. The microcatheter could not pass through the stent mesh in one aneurysm. The two week follow-up angiogram showed complete occlusion of the aneurysm and a patent carotid lumen in a case after successful stenting and glue embolization without distal migration of glue. Tungsten in the glue was noted to migrate out of aneurysm into the soft tissue of the neck. Histopathologic examination showed successful obliteration and stable organization of the aneurysmal lumen with ingrowth of fibroblasts and a foreign body reaction. In contrast, the aneurysms without the glue embolization being performed showed partially thrombosed aneurysmal lumens that became smaller and indistinct on the 8 week follow-up angiograms. Histopathologic examination showed a disorganized thrombus with numerous recanalizations.

**Conclusion:** Glue embolization after stenting could be performed for aneurysm without distal migration of the glue or gluing of the catheter. This concept appears to be useful for applications to the further research and the treatment of aneurysm.

**Index words :** Aneurysm, cerebral  
Stent and prostheses  
Interventional procedures, technology  
Interventional procedures, experimental studies

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