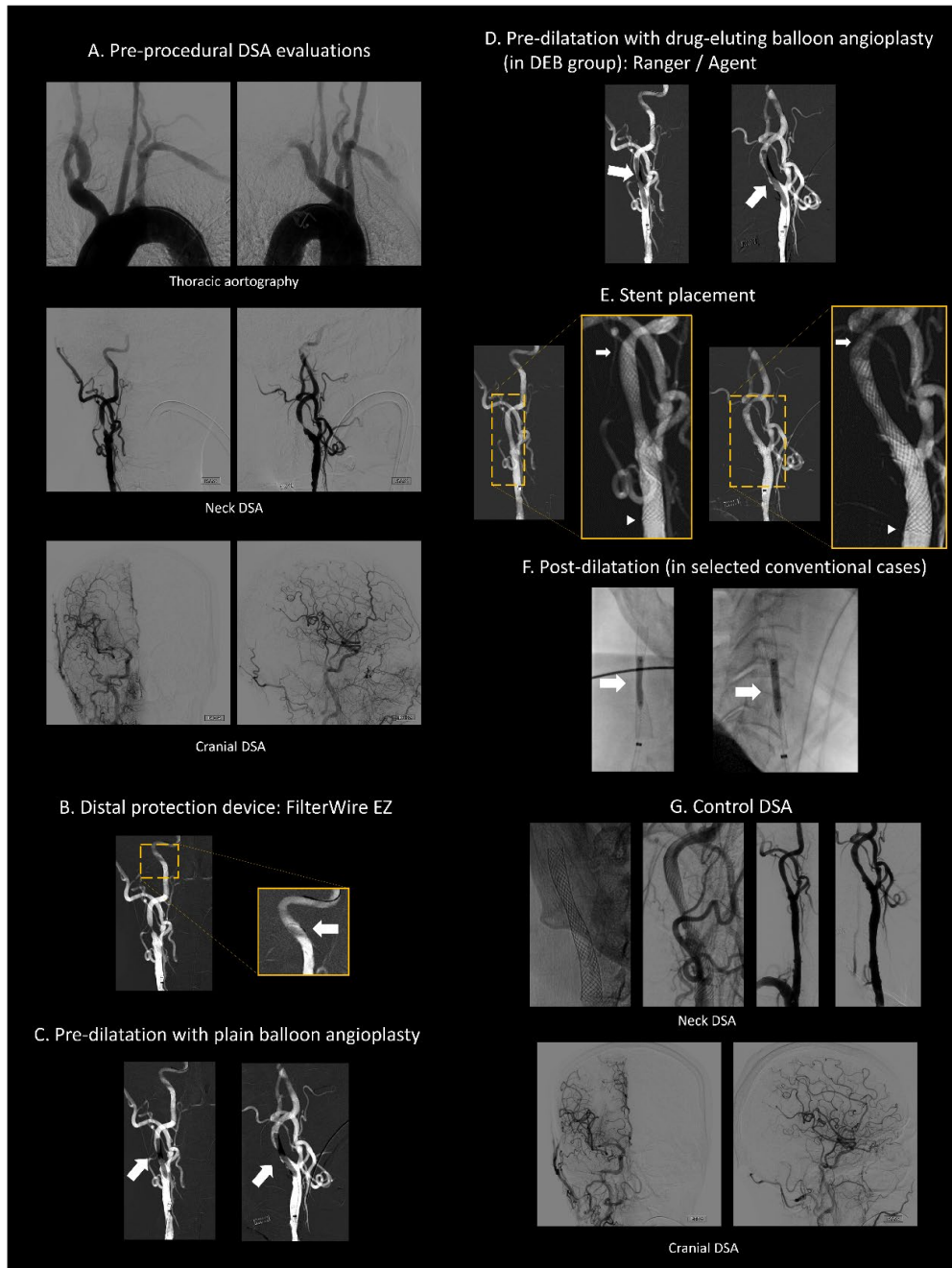


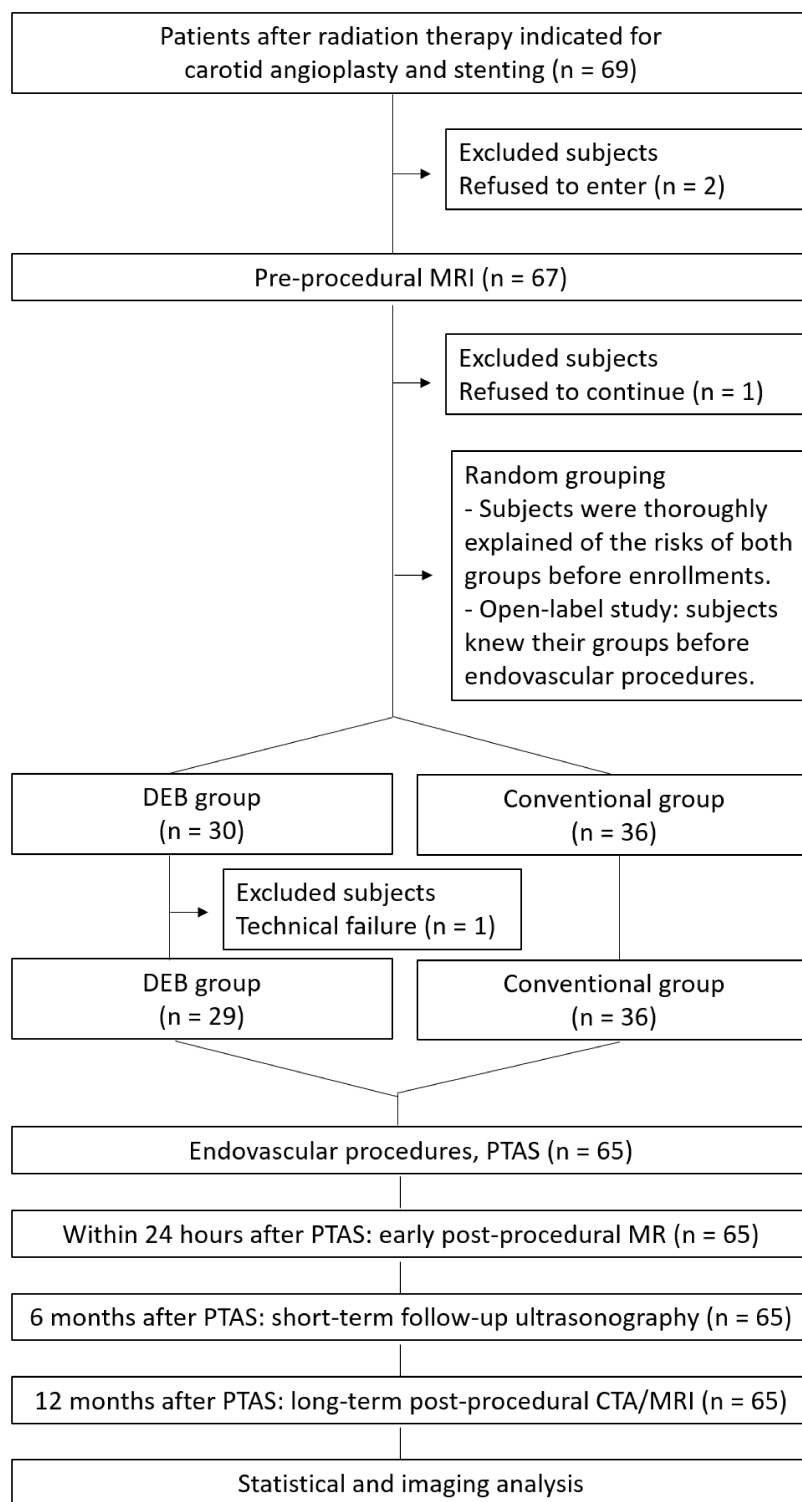
SUPPLEMENTS



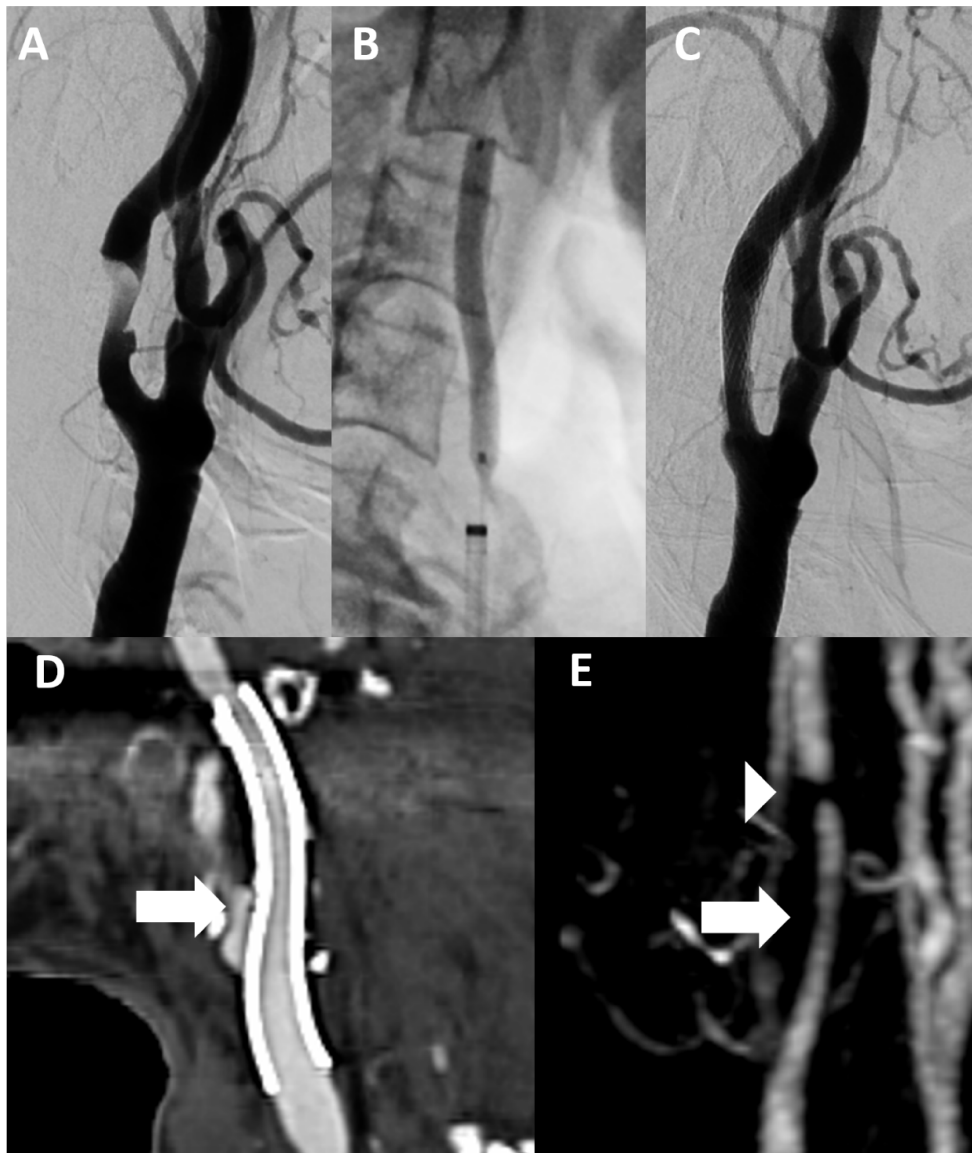
Supplementary Fig. 1. Standardized endovascular protocols.

(A) The preprocedural digital subtractive angiography (DSA) included thoracic aortography for the general vasculature, bilateral neck DSA for carotid artery stenosis

depictions and bilateral cranial DSA for intracranial vascularization. **(B)** A distal protection device (FilterWire EZ) was deployed around cervical spinal C1-2 levels (arrow) to prevent distal emboli in the angiographic procedures. The protection device was retrieved after stent placement. The solid box demonstrates magnified imaging of the dotted box. **(C)** Predilatation was performed with noncompliant coronary (EMERGE) or peripheral artery (Sterling) balloons (arrows). The balloons were inflated to nominal levels to reduce the vascular waists. **(D)** In the drug-eluting balloon (DEB) group, primary angioplasty with DEB (PADEB) was performed after the predilatation step. PADEB was conducted with an over-the-wire paclitaxel-coated percutaneous transluminal angioplasty (PTA) balloon catheter (Ranger™ or AGENT™ balloon catheters), and DEB was inflated to the nominal level for 30 to 60 seconds (arrows). **(E)** Carotid stents (Wallstents) were then meticulously deployed. Arrows and arrowheads mark the distal and proximal ends of the stents. The solid boxes demonstrate the magnified imaging of the dotted boxes. **(F)** Postdilatation was performed in selected cases in the conventional group (arrows). Technical success was defined as residual stenosis < 30%. Note that no postdilatation was performed in the DEB group to avoid detachment of the coated drugs on the vascular endothelium. **(G)** Control DSA was performed to evaluate the neck lesions and intracranial vascularization after stenting.

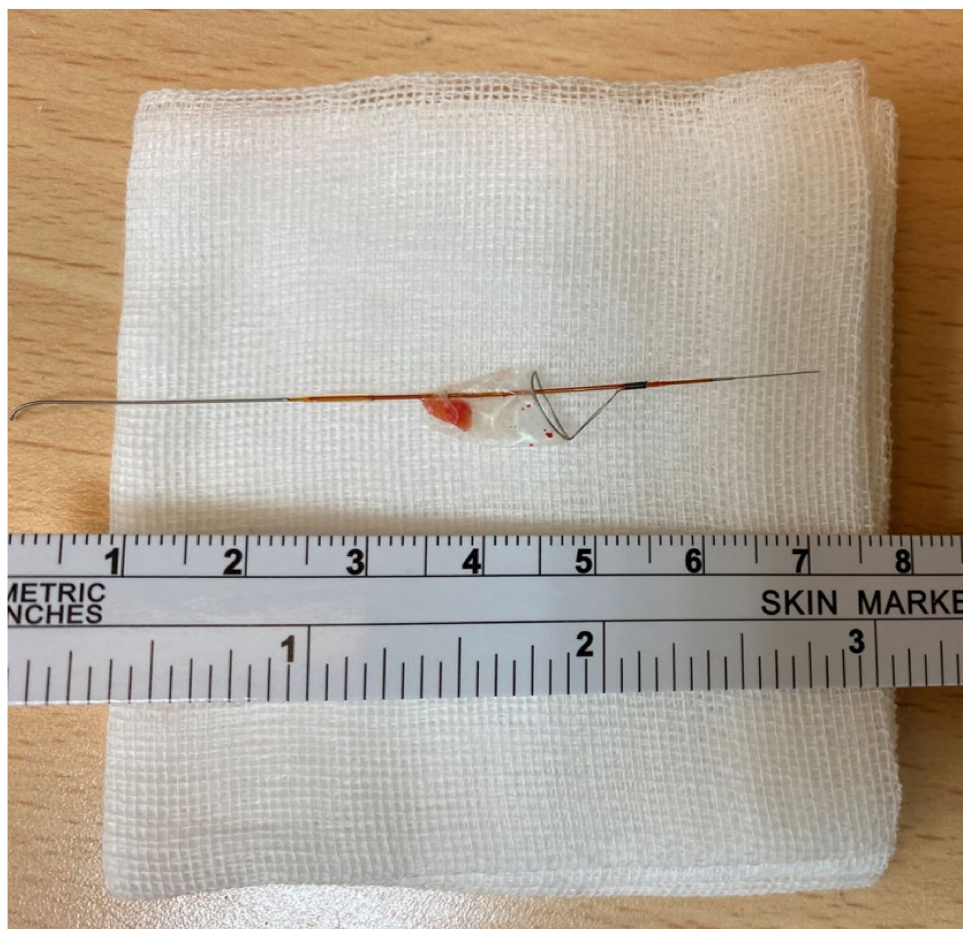


Supplementary Fig. 2. A flow diagram to demonstrate subject recruitment.



Supplementary Fig. 3. The only case in the DEB group with significant in-stenosis restenosis (ISR) on long-term postprocedural computed tomography angiography (CTA) and magnetic resonance imaging (MRI) (A) Preprocedural digital subtractive angiography (DSA) demonstrated 70.1% stenosis at the right internal carotid artery (ICA). (B) Drug-eluting balloon (DEB) angioplasty was performed successfully. (C) The control angiogram revealed residual stenosis of

approximately 25.3%, indicating technical success ($\leq 30\%$). (D) Long-term postprocedural CTA performed 359 days after stenting revealed suspicious ISR (arrow). (E) Long-term postprocedural contrast-enhanced MR angiography confirmed the presence of ISR with approximately 51.01% narrowing (arrow), indicating significant ISR ($\geq 50\%$). The signal cancellation at the distal end of the stent was due to metallic artifacts (arrowhead).



Supplementary Fig. 4. Distal embolus captured by the distal protection device in a DEB group subject.

The distal protection device was cut off from the microwire to demonstrate the captured embolus. The embolus was approximately 0.5 cm in length, large enough to cause catastrophic intracranial large vessel occlusions.