Flow diversion stent

Flow diversion stent and flow disruption stent“ are terms often used interchangeably in medical literature, but there are subtle differences in their mechanisms of action and intended use:

Flow Diversion Stent:

A flow diversion stent is designed to divert blood flow away from the aneurysm, reducing pressure within the aneurysm sac and promoting thrombosis (clot formation) within the aneurysm. These stents are typically densely meshed tubular devices made of a high-density metal alloy such as nitinol. The mesh-like structure disrupts the flow of blood into the aneurysm while preserving the normal flow in the parent vessel, allowing the aneurysm to gradually thrombose and seal off. Flow diversion stents are often used for large, wide-necked, or complex-shaped intracranial aneurysms where traditional treatment methods like surgical clipping or endovascular coiling may not be suitable or effective. Examples of flow diversion stents include the Pipeline Embolization Device (PED) and the Silk Flow Diverter.

Flow Disruption Stent:

A flow disruption stent is also designed to disrupt blood flow within the aneurysm, but it works by promoting turbulent flow and stasis within the aneurysm sac rather than diverting flow away from it. These stents typically have a lower metal surface area coverage compared to flow diversion stents, leading to increased turbulence within the aneurysm and promoting thrombosis. Flow disruption stents are often used for smaller, saccular aneurysms where flow diversion may not be necessary or appropriate. Examples of flow disruption stents include the Woven EndoBridge (WEB) device and the PulseRider device. While both types of stents aim to treat intracranial aneurysms by altering blood flow and promoting thrombosis, they achieve this through slightly different mechanisms. The choice between flow diversion and flow disruption stents depends on various factors including the size, shape, and location of the aneurysm, as well as the patient's overall health and treatment goals.