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Perspective

Advanced Techniques for Percutaneous Cardiac Intervention

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DESCRIPTION

TEE (Transesophageal Echocardiogram) is frequently employed to support interventional cardiac procedures such as balloon mitral valvoplasty, percutaneous closure of the patent foramen ovale and the ASD, implantation of an atrial appendage occluder device to treat atrial fibrillation, percutaneous repair of the mitral valve, and percutaneous replacement of the aortic valve. TEE provides assistance in evaluating a procedure's viability. For instance, an effective device closure requires enough tissue rim around an ASD (Autism Spectrum Disorder). It is crucial for spotting pathologies that would make an operation contraindicated such a left atrial thrombus. TEE is utilized to monitor the correct positioning of the transseptal needles, guide wires, and devices during the intervention. By detecting residual shunt, valvular regurgitation, and problems such pericardial effusion and device impingement, it may also be used to evaluate the effectiveness of the treatment.

The discipline of percutaneous cardiac interventions was first developed in the 1960s, and since Gruentzig's introduction of percutaneous coronary procedures in 1978, it has experienced remarkable expansion. With an estimated 492000 treatments performed in 2010, Percutaneous Coronary Intervention (PCI) is the most widely used revascularization therapy in the United States today. Over the past ten years, invasive pediatric treatments have increased due to greater technology and more success. Interventions in the peripheral vascular system have expanded to include venous procedures in addition to arterial procedures. The technique is beneficial in reducing symptoms in individuals with stable ischemic heart disease, according to studies conducted over the previous ten years. PCI is the preferred course of therapy for the majority of patients with moderate- to high-risk acute coronary syndrome and ST-segment-elevation myocardial infarction because it lowers symptoms as well as mortality and myocardial infarction. It is hardly unexpected that between 1980 and 2006, PCI grew continuously and significantly. Recent research reveals that for patients with acute coronary syndrome, this rise has plateaued, and it has decreased for individuals with stable ischemic heart disease.

Planning is essential for a successful PCI. Access to the procedure site, anticoagulation and antiplatelet therapy, accurate assessment of the target lesions, intravascular imaging, adjunct therapies (such as atherectomy or other procedures to modify the plaque), and the instruments required to carry out the procedure and manage complications should all be available. Engaging the target system with the guiding catheter, wiring the lesion, preparing the lesion for stenting, and lastly placing the stent are the key straightforward processes for every PCI. Each step alone might be difficult.

Radial approach-in comparison to femoral approach, radial method had a longer radiation exposure period. This used to be true since there was a learning curve, but as operators gained expertise, it stopped being true. Even yet, the right radial route has fewer difficulties than the femoral method whereas the left radial technique has higher operator radiation. The operator's radiation exposure might be reduced by wearing the proper radiation protection. The dilation ratio in the radial artery is dependent on the baseline size, the existence of atherosclerotic disease, and calcifications, much as in any other artery. When dilatation is done incorrectly, complications might happen. Following the insertion of a sheath and radial or ulnar artery access, a specific drug combination is utilized to prevent spasm.

Understanding coronary artery lesions-the most prevalent cause of coronary artery disease is atherosclerosis. Operators must be aware of the physiological differences and invasive treatment options for additional etiologies, including inflammatory post-transplant vasculopathy (Cardiac Allograft Vasculopathy-CAV), vasculitis, aneurysms, and spontaneous coronary artery dissections. These unique etiologies necessitate particular considerations even though the fundamental concepts of therapies are identical.

The best guide catheter may be chosen from a variety of designs offered by various medical businesses. Everybody has their own radial or femoral approach catheter designs. They appear similar and have the same fundamental idea. The operator should be familiar with the benefits and drawbacks of each and feel confident handling difficulties as they arise. A crucial first step is choosing the right guide catheter. Instead of utilizing a bad guide catheter, it can make the intervention much simpler and safer.

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