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Stent-less Angioplasty in Current Era

Cardiovascular diseases (CVDs) are the leading cause of death globally, taking an estimated 17.9 million lives each year. More than four out of five CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age. Coronary artery disease (CAD) is the leading cause of death globally, and a major contributor to disability. Coronary arteries are the vessels supplying blood to heart muscles, Blockage of these vessels causes heart attack. Angiogram is the gold standard test for detection of CAD. Coronary angiography was described by Mason Sones in the early 1960s.Later Andreas Gruentzig in the late 1970s did the first balloon angioplasty and started the era of interventional cardiology. But problems associated with balloon angioplasty like early re-stenosis, vessel recoiling, abrupt closure due to dissection etc, occurred in up to 50% patients. These led to the development of metallic stents. The first stents were implanted in 1986 in Switzerland by Ulrich Sigwart and in France by Jacques Puel. Although the bare metal stents (BMS) solved vessel recoiling, high rates of re-narrowing or in-stent restenosis (ISR) up to 30% remained as a problem. This in-turn triggered the development of Drug eluting stents (DES). With state of the art, image and physiology guided angioplasty we have been able to reduce the ISR rate to a significant extent. Treatment of complex lesions, diffuse lesions, small vessels remain challenges; these are associated with high future event rates even in the current era. Need for long term dual antiplatelet therapy after DES is another problem. Feeling of

a metallic material inside the body is worrisome for many patients. Absorbable stents were developed but not popularised as it never demonstrated superiority over current generation DESs.

Therefore, the focus now is on Drug coated Balloons (DCB). Drugs like paclitaxel and sirolimus which are present in the DES, incorporated on the balloon surface are adsorbed into the vessel wall during inflation. These drugs have antiproliferative properties, they prevent cell proliferation thereby reducing ISR. Currently DCB are approved treatment for ISR, instead of placing another layer of metallic stents. Its efficacy in treating small vessels has also been established. There is promising data on other types of CAD like de novo large vessel disease and in acute coronary syndromes. With imaging modalities like Intravascular Ultrasound (IVUS), optical coherence tomography (OCT) we can identify suitable vessels and lesions for selecting DCB as treatment instead of metallic DES. With rising prevalence of Diabetes mellitus, proportion of small vessel and diffuse coronary artery disease are increasing. Also, more young people are getting affected with CADs and putting metallic stents at younger age is unappealing. Stent-less PCI with DCB in a good option for many such patients with CAD in the current era. This contemporary procedure and technology are available being practised routinely at our facility. Technology is sure to progress in the coming years.