Shaping an ectatic coronary artery: Stentys implantation

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We report about a 53 year old man, active smoker and hypertensive in therapy with ace-inhibitors, who was admitted to our Division for Unstable Angina. In 2008 he underwent coronary angiography for Non St Segment Elevation Myocardial Infarction, with demonstration of an occlusion of right Coronary Artery Disease, and of ectatic left coronary arteries, which was managed with a successful implant of a Drug Eluting Stent on mid segment of left circumflex artery.

In July 2013 for typical chest pain without alteration of electrocardiogram and of echocardiographic kinesis, he underwent radial angiography, showing nonsignificant intrastent proliferation on circumflex artery and a significant stenosis on midleft descending artery (Fig. 1) just in the midtract of an ectatic trait. At IVUS imaging, plaque volume of 18 mm² was elaborated, with external diameters of 6.5 and 6 mm (Fig. 2).

The extremely large caliber of the coronary vessel and the need for implant of a Drug Eluting Stent due to the young age of the patient lead to a drug eluting Stentys (3.5–4.5 mm × 27; Figs. 3, 4) which was implanted after predilatation with coronary balloon (Maverick 3.0 × 20 mm at 16 atm).

IVUS (intravascular ultrasound) demonstrated imperfect apposition in the mid segment of the stent in the localization of a calcific plaque (Fig. 5) with a luminal area of 6.68 mm². After postdilatation (Maverick 4 × 20 at 14 atm), luminal area improved to 11.19 mm² (Figs. 6, 7).

A localized or diffuse dilatation of the coronary artery with a diameter at least 1.5 times the adjacent normal coronary artery is the most exploited definition of coronary ectasia [12]. The incidence is reported to be 0.3% to 4.9% in patients undergoing diagnostic coronary angiography or as determined by autopsy.

The heterogeneity of the coronary artery morphology and relatively larger vessel size makes it hard to assess stent type and size, and to achieve complete expansion with the usual coronary devices [3].

The use of self expandable coronary stents may recall pioneering era of percutaneous coronary intervention: actually Wall stent, a self expandable device, was the first to be implanted in humans [4]. Later, also because of high thrombosis rates of more than 10%, they were replaced by balloon-expandable stents [5], which allow an accurate control of dimension due to variations of inflation pressures and also very precise placement. On the other side, relative still high frequency of stent deployment and undersizing due to coronary anomalies, despite widespread use of imaging techniques [6], lead to a new kind of device. The self-expanding STENTYS stent is a nitinol (nickel–titanium alloy) stent that, upon deployment, exerts a constant

Fig. 1. Left Anterior Descending artery (Cranial Right Anterior Oblique projection).
outward force while vasoconstriction and thrombus disappear, being very different from the sharp wire ends of the Wallstent.

This device was at first designed for coronary bifurcations [7], because the metallic platform enables easy crossing and opening of stent cells and thus optimal scaffolding of the side branch ostium and soon after this was tested for patients presenting with acute myocardial infarction, with favorable results on surrogate endpoints [8].
While ectatic lesions represent a natural use of these stents, only few data have been reported in literature [3,9], showing favorable results especially with imaging techniques. For example, for the present patient, self expandable nitinol structure was not enough to obtain a complete apposition of the struts of the stent, needing a postdilatation after IVUS.

STENTYS, together with the use of imaging technique, represents a safe and efficacy strategy for ectatic lesions.

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References


Olfactory non-cancer effects of exposure to ionizing radiation in staff working in the cardiac catheterization laboratory☆

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X-rays and nuclear medicine are the largest man-made sources of ionizing radiation exposure in developed countries. Cath Lab operators reach an estimated head cumulative lifetime exposure dose, in absence of protection, of 1 to 3 Sv, corresponding to a brain equivalent dose of around 500 mSv. The left part of the operator is more exposed than the right part in most cases, due to the usual layout of a Cath Lab [1].

The brain is a radio-resistant organ according to the Law of Bergonié and Tribondeau (1906), due to its low mitotic activity and high differentiation, but a clear correlation between radiotherapy and white matter damage has been found [2].

Biological effects of ionizing radiation exposure occur consequently to DNA damage in directly irradiated cells. Moreover, Roguin [3] reported various evidences of cancer effects due to ionizing radiation exposure among physicians.

Another effect of radiation exposure occurs at the neural cell level, with four potential cellular targets of radiation damage: endothelial cells, sensitive to radiation but able to increase their number after an initial reduction caused by exposure, oligodendroglial stem cells, destroyed after high-dose exposure and presenting subsequent delayed demyelination, microglial cells, whose decrease is documented in the spinal cord of exposed rats, and neural stem cells, origin of adult-born neurons. Adult neurogenesis seems to occur in the subgranular zone of the dentate gyrus of the hippocampus and in the subventricular zone, where the generated cells migrate through the rostral migratory stream, giving rise to new neurons at the olfactory bulb level [1].

Other human neurocognitive effects include a possible risk of schizophrenia [4–6], mental retardation and cognitive disorders [7,8], but the association between medical radiation exposure and cognitive disorders is not clear and requires future investigation [2,4].

In humans, clinical onset of Alzheimer’s (AD) and Parkinson’s (PD) diseases is often anticipated by initial evidence of neural damage in neural stem cells and microglial cells [9], and by a marked decrease in olfactory function. At a peripheral level, olfactory receptor cells are located in the olfactory mucosa, receiving a relevant amount of radiation in exposed people, being less protected than more internal areas involved in olfactory signal processing.