"replacement" in this context is rather a semantic one. In our series of 4 patients, with 3 having had a transannular patch at tetralogy of Fallot repair and one having had a commissurotomy at repair of valvular pulmonary stenosis, all patients have had a native, although stenotic, pulmonary valve. Therefore by implanting a pulmonary valve prosthesis within the native valve, this valve and its function are being replaced. With regard to an enlarged right ventricular outflow tract (RVOT), we believe that reduction plasty is necessary in patients with a diameter of greater than 28 mm for 2 reasons. First, the Shelhigh Injectable Valve is available in a maximal size of 33 mm. Following the recommendations of Schreiber with oversizing of at least 2 mm would mean that patients with an RVOT of greater than 31 mm could not be treated with this new technique. However, it is this subset of patients with chronic pulmonary regurgitation that present typically with enlarged RVOT and profit the most from this method. Second, it is well known from the literature that an enlarged RVOT is deleterious for the function of the right ventricle[1] and might be a source for ventricular arrhythmias and consecutive sudden death.[2,3] Surgical treatment should therefore not only be focused on pulmonary valve replacement, but also additional problems should be addressed concomitantly. Because reduction plasty can also be done safely and easily off pump, does not lead to stenosis, and reshapes a conical RVOT to a more tubular form in which the inserted valve prosthesis finds better seating, we would still recommend it. We of course also perform an in-depth analysis of right ventricular function and the morphology of the RVOT by means of transesophageal and transthoracic echocardiography and magnetic resonance imaging preoperatively to assess the feasibility of this procedure in an individual patient.

Pascal A. Berdat, MD
Thierry P. Carrel, MD
Swiss Cardiovascular Center Bern
Clinic for Cardiovascular Surgery
University Hospital
Bern, Be 3010, Switzerland
E-mail: pascal.berdat@insel.ch

References

1. Redington AN, Oldershaw PJ, Shinebourne EA, Rigby ML. A new technique for the assessment of pulmonary regurgitation and its application to the assessment of right ventricular function before and after repair of tetralogy of Fallot. *Br Heart J.* 1988;60:57-65.
2. Vogel M, Sponring J, Cullen S, et al. Regional wall motion and abnormalities of electrical depolarization and repolarization in patients after surgical repair of tetralogy of Fallot. The substrate for malignant ventricular tachycardia? *Circulation.* 1997;95:401-4.
3. Harrison DA, Harris L, Siu SC, et al. Sustained ventricular tachycardia in adult patients late after repair of tetralogy of Fallot. *J Am Coll Cardiol.* 1997;30:1368-73.

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Tracheal stents in patients with malignancy

To the Editor:

We read with interest the article by Sihvo and colleagues[1] titled "Fatal Fistula Between the Trachea and the Brachiocephalic Artery: Late Complication of a Second-Generation, Self-Expanding Metallic Tracheal Stent."

In recent years, the use of this new type of stent has become more frequent, with a consequent improvement of quality of life and survival in patients affected by inoperable malignant disease or benign disorders. The use of these stents has been encouraged by their easy deployment, which often can be performed through a fiberoptic bronchoscope. However, they are expensive, and sometimes their use can be questioned in patients with a relatively limited life expectancy and tendency to neoplastic tissue growth. The second-generation self-expanding metallic stents reach the largest diameter in 36 to 48 hours after deployment. Covered stents should be preferred, especially in the case of malignancy, to avoid tissue grow within the mesh of the stent and formation of granulations.

Traditionally, we have preferred silicone stents (Dumon stents; Novatech, La Ciotat Cedex, France), having placed more than 200 of them over a period of 13 years. Erosion was never a complication. Minor complications were secretion retention and granulations on one edge of the stent (1% in the neoplastic population); also, displacement never happened in patients with cancer. We also have a small experience with self-expandable stents (12 patients with 14 stents); however, they were used in a very well selected group of patients with difficult anatomic situations, and most of them had a tortuous posttransplant bronchial stenosis with a malacic component.

In the text of the article it is not clear whether the first two stents, and in particular the first one used in that patient, were covered or not. Could the authors clarify this?

Again, we encourage the use of silicone stents in patients with malignant tumors; they are less expensive, easy to place, and can be removed or changed if required by the clinical situation.

Marco Anile, MD
Tiziano De Giacomo, MD
Federico Venuta, MD
University of Rome "La Sapienza"
Policlinico Umberto I
Department of Thoracic Surgery
00161 Rome, Italy

Reference

1. Sihivo EI, Sioris T, Tynnien O, Salo JA. Fatal fistula between the trachea and the brachiocephalic artery: late complication of a second-generation, self-expanding metallic tracheal stent. *J Thorac Cardiovasc Surg.* 2006;131:1415-6.

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Reply to the Editor:

We thank Drs Anile, Giacomo, and Venuta for their valuable comments, encouraging the use of silicone stents in patients with malignant disease. They state that silicone stents are less expensive, easy to place, and can be removed or changed if required by the clinical situation.

If possible, surgery is the preferred treatment for benign and malignant tracheal obstruction. However, many patients have inoperable tumors and must undergo palliation, for example, with stenting, either expandable metallic stents or silicone stents. Lately, we have used second-generation metallic stents placed with the aid of a flexible endoscope because patients with silicone stents seem to have severe secretion problems and migration. These complications lead to stent obstruction necessitating reinterventions with a rigid bronchoscope, increasing the total costs of the initially lower cost treatment. We know the disadvantages of second-generation self-expanding stents (tumor ingrowth, especially in uncovered stents, and difficult removal).[1] However, the quality of the short life after placement

of a self-expanding metallic stent appears to be better than after placement of silicone ones. The initially smaller inner diameter of silicone stents is often further reduced by dislodgment, distention, and airway secretions resulting from loss of mucociliary clearance. Until now, we have placed about 150 self-expanding metallic stents in approximately 120 patients with inoperable tumors. In this group, the median survival of patients with malignant disease is about 3 months. On follow-up, we have seen erosion through the airway in 2 patients; the patient in the referenced article had a covered stent with a fistula[2] after more than 40 months, and the second patient had erosion after 1 year of stent placement. Hence, it is evident that even second-generation self-expanding metallic stents must be used with caution in patients with expected longer survival. In fact, the most important thing in the treatment of tracheobronchial obstruction is the skill to select the right patients for surgery, the type of stent being of secondary importance influenced by personal preferences.

Jarmo Salo, MD, Prof
Thanos Sioris, MD, PhD
Jari Räsänen, MD
Eero Sihvo, MD, PhD
Helsinki University Central Hospital
Helsinki, Finland

References

1. Toikkanen V, Nemlander A, Rämö OJ, Salminen J, Pekkanen A, Isolauri J, et al. Expandable metallic stents in the management of malignant esophageal obstruction. *Ann Chir Gynecol.* 2000;89:20-3.
2. Sihvo EIT, Sioris T, Tynninen O, Salo JA. Fatal fistula between the trachea and the brachiocephalic artery: late complication of a second-generation, self-expanding metallic tracheal stent. *J Thorac Cardiovasc Surg.* 2006;131:1415-6.

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