Discussion to: The concept of cone creation to treat isolated tricuspid valve dysplasia and the case of a double orifice tricuspid valve

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Dr Luciana Da Fonseca Da Silva (Pittsburgh, Pa). Thank you for the privilege to comment on your video and thank you, Dr Quarti, for showing me the video in advance. Tricuspid valve dysplasia is a rare disease, and surgical treatment can be challenging. The 2 narrow leaflets with scarce tissue for the valve repair. This video has demonstrated the case with double orifice and tricuspid dysplasia being repaired with the principles of the cone technique. The application of the cone principles undoubtedly can be helpful, especially when the mechanism of regurgitation is leaflet movement restriction. The authors have reported 3 cases in the paper. Could you please describe the anatomical findings and the details of the technique applied in the other 2 cases? The creation of a competent valve with native valve tissue, coaptation against valvar tissue is the main principle of the cone technique. In tricuspid valve dysplasia, since you do not have the downward displacement, you have the benefit of finding valvular tissue all around the tricuspid annulus level. After releasing the tethering and reducing the tricuspid annulus, you can work with this tissue by rotating plicating and suturing in many different ways. The use of a patch in a large extension of the annulus is not worrisome in adults.

However, in children, because the patch will not grow, you can cause restriction and stenosis in the follow-up. I understand that it was done in adult patients, but I would like your comments to see what you would do if the patient was a child. When using the cone technique in Ebstein or tricuspid dysplasia, in a specific case, we use redundant autologous pericardium, but only in the septal area, working the native leaflet tissue in the other areas. Releasing the papillary muscle deeply in the right ventricle apex is another way to create more length in the leaflets. I notice in your video that some of the muscles could release a little bit longer deep in the anterior leaflet, improving the central coaptation, avoiding patch use. Finally, have you considered using other types of patches like bioengineered materials? Congratulations on your wonderful video and the excellent surgical results.

Dr Andrea Giulio Quarti (Bologna, Italy). Oh, thank you very much. We described 3 patients, and the other 2 patients were between 20 and 30 years of age. One patient had a septal leaflet attached to the septum which consisted of different patches of tissue attached to the septum. So, in that case, I applied a real cone technique. I rotated the inferior leaflet to cover the septum. And then I did a plication of the annulus, and at the end, the coaptation was absolutely good. The other patient had an anterior leaflet that was very short. The leaflets were detached from the annulus, the comissures were closed and the anterior leaflet was enlarged with an autologous pericardium with an elliptic shape. The tricuspid valve annulus was reduced and the cone was reinserted on the annulus. Second question: yes, in case the patient is a kid, of course, it is very important to avoid using foreign tissue because it may shrink over time, it may calcify, and probably this reduces the durability of the repair.

I always keep in mind to avoid foreign tissue for every type of valve repair, also in the setting of aortic valve repair. If the child has an Ebstein, usually the anterior leaflet is so long that it doesn’t need to be elongated. So, it happens to use foreign material to create a new septal leaflet or to
elongate the short septal leaflet, but it never happened to me to use a patch to increase the anterior portion of an Ebstein valve in the pediatric population. And of course, to answer your last question, the more you dissect the subvalvar apparatus, the more the subvalvar apparatus goes through the apex of the valve. And in that case, the movement of the leaflets does not depend on the movement of the right ventricular wall. In conclusion, the risk of tethering after the repair is reduced. Maybe you mean that. I mean, if you dissect this valvular apparatus, the movement of the leaflets is not going to depend on the movement of the right ventricular wall. I totally agree with you. So, probably, I should dissect more and more of the papillary muscle in order to free the leaflets from the right ventricular wall also in adult cases.

Dr Da Fonseca Da Silva. Okay. Thank you.
Dr Quarti. Thank you.
Dr Da Fonseca Da Silva. And regarding the material…
Dr Quarti. Oh, sorry. Well, I try never to use heterologous pericardium on the right side. And in regard to bioengineered material, I had a bad experience with some of them in the past. Actually, I prefer to use autologous pericardium unless we will find some other material with long-term durability.

Dr Da Fonseca Da Silva. Thank you.