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Küçük aortik annuluslu olgularda mekanik aort kapaklarının hemodinamik performansı

Hemodynamic performance of mechanical aortic valves in narrow aortic annulus cases

Sayın Editör;

Derginizde yayınlanan makalede (1), 21 numara St Jude mekanik protez kapak ile 21 numara Sorin biokarbon karşılaştırılmıştır. Bu güzel çalışma için arkadaşlarımı kutlarım.

Bu iki kapak orifis alanları bakımından farklı olmakla birlikte aort kapak replasmanında (mekanik ve stentli bioprotez) takılan kapağın basınç gradiyenti problemi karşımıza çıkmaktadır. Bu problemi çözmek amacıyla geliştirdiğimiz kapağı (2, 3) optimize ettik (Resim 1). Aort kapak cerrahisinde stentli kapaklarda hastanın vücut alanına uygun orifis alanına sahip kapak replasmanı problemini çözmek amacıyla geliştirilen çok düzlemli mekanik kapağın basınç problemini çözdüğüne ilişkin deneysel ve kuramsal çalışmalar yayınlanmıştır. Bu çalışma; çok düzlemli kapak için en büyük orifis elde etmek amacıyla yapılmıştır.

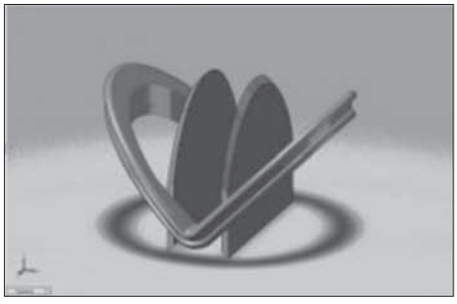
Çok düzlemli aort kapağı; efektif orifis alanını, liflet stentini aortik annulus yerine assandan aorta içerisine uzatarak artırmaktadır. Koroner arter ostiyumları genelde iki adet olup bu kapak hem diyastolde, hem de sistolde bu ostiyumların açık kalmasını sağlamaktadır. Bir liflet tarafından, lifletin kapalı konumdan maksimum açık olduğu konuma gelinceye kadar taradığı alana "tarama alanı" denir. Stentin iç kısmı tarafından oluşturulan alana da "orifis alanı" denir.

Günümüzde kullanılan biliflet kapaklarda, kapağın iç çapının 2 cm olduğunu varsayarsak, orifis alanı 3,14 cm^2 olarak hesaplanır. Lifletler 90° açıldığında, her iki liflet tarafından taranan alan 6 cm^2 olarak belirlenir (1 cm yarıçaplı yarım kürenin yüzey alanı, $4\Pi r^2$).

Çok düzlemli bir kapağı optimize etmek için, stent tarafından oluşturulan orifis alanının liflet tarafından taranan alana eşit olduğu açı (assandan aortaya uzanan stent ve annulus düzlemi arasındaki açı) optimal çok düzlemli aort kapağının açısı olmalıdır. Bu açı 45 derece olup her 2 liflet stenti arasındaki açı 90° olmalıdır.

Bu optimize edilen mekanik aort kapağımızla basınç gradiyenti problemini çözmeye çalıştık.

Saygılarımızla,



Resim 1. Optimize edilen aortik kapak

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Yazarın yanıtı

Sayın Editör,

2005 yılında yayınlanan makalemizde (1) Küçük aortik annuluslu olgularda mekanik aort kapaklarının hemodinamik performansı değerlendirilmiştir. Size gelen mektupta geliştirilen optimalize mekanik aort kapağı ile basınç gradiyenti probleminin giderilebileceği belirtilmiştir. Yazara makalemizi değerlendirmesinden dolayı teşekkür etmek isterim. Yeni model ile yapılan çalışmalar olumlu sonuçları göstermektedir. Ben de aort kapak replasmanı yapılan hastalarda sıkıntılı bir durum olan basınç gradiyentini çözecek bu çalışma için araştırmacıları kutluyorum.

Saygılarımla,

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Does radial artery harvesting for coronary artery bypass grafting impair the hand circulation?

Koroner arter baypas greftleme için radyal arter hazırlanması el dolaşımını bozar mı?

Dear Editor,

I read with great interest the article by Küçükarslan et al. (1) that raised the question of whether radial artery harvesting disturb the palmar blood supply and functions in the early postoperative period. They have stated that, in properly selected patients, radial artery removal does not change the forearm blood supply and functions with little sensory disturbances on postoperative 15th day. I congratulate the authors on their early successful outcomes. I would also like to ask some corrections and contributions on this important topic.

First of all, I must correct an error made by Küçükarslan et al. in their conclusion for the benefit of all readers and that is, removal of the radial artery may change the forearm blood supply. However, several studies have shown that there were no significant reductions in forearm blood flow 3 months after surgery at harvested arm. The authors' conception is some arbitrary. In fact, there is no a comparison between preoperative and postoperative forearm blood flows in this study. Manabe et al. (2) has reported that the blood flow to the forearm territory was decreased by 20% after removal of the radial artery in spite of compensatory dilatation of the ulnar artery.

Following radial artery harvesting, it has no been fully known changes in hand circulation. Severe hand ischemia is a rare complication resulting in gangrene or resting pain. The etiology of this devastating complication is unclear. It may be due to abnormal continuity of the peripheral arterial system of the digits with the palmar arch or occlusive artery disease in the forearm. However, mild hand ischemia such as hand claudication or hand fatigue encounters approximately in 10% of the patients undergoing radial artery removal. Hand claudication after radial artery harvesting frequently dominates in patients with special occupations such as accordionist or dentist. Some symptomatic patients do not use affected hand after removal of radial artery. Therefore, a lot of symptoms may have been overlooked or supposed of non-ischemic origin in most patients.

There are various preoperative screening methods to assess the adequacy of ulnar collateral circulation to avoid ischemic complications of the hand in patients scheduled for radial artery harvesting for coronary artery bypass grafting. The Allen test is the most common used tool, but this test is far from ideal because it is associated with false-positive and false-negative results. Therefore, many studies have been performed to investigate more reliable and sensible methods to reveal the risk of ischemia. Possible other methods are modified Allen test, Doppler ultrasonography, digital plethysmography, pulse oximetry, thumb systolic arterial pressure measurement, and magnetic resonance imaging or a combination with those methods.

In addition, "Squirt test" is a simple technique that allows intraoperative assessment of ulnar artery blood supply to the hand before removing the radial artery from the forearm (3).

Lastly, in discussion section of the paper, statements as Gregory et al., William et al. and Zile et al. written mistakenly by the authors should be corrected to Dumanian et al., Chong et al. and Meharwal et al. In the first paragraph of the authors' discussion, some data in their reference 8 (Chong et al.) also is not consistent to explanations in their text. The rate of 11% is objective paraesthesia in the thenar eminence related to injury to the lateral cutaneous antebrachial nerve in the above-mentioned reference.

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Author`s reply

Dear Editor,

I would like to thank author for the interest in my article.
Sincerely yours.

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Response to the case report of pulmonary artery coil migration after management of patent ductus arteriosus in a 65-year-old female patient

Altmış beş yaşındaki kadın hastada patent duktus arteriozus tedavisini takiben pulmoner arter tıkacının yer değiştirmesi ile ilgili olgu sunumuna yanıt

We read the case report presented by Senturk et al with great interest (1). They presented a 65-year-old female patient with patent ductus arteriosus (PDA). Unfortunately, their trial for closing the ductus had failed due to the displacement of the coil to the left pulmonary artery.

A clinical trial conducted over 1291 patients in 30 centers showed that long and tubular PDA might result in undesired consequences whereas short and thick PDA (ductal diameter>4mm) was addressed as the reason of unsuccessful results (2). It was reported that the success of the procedure was determined when the ideal coil/ductal diameter ratio is equal to two (3).

An unpublished study of ours investigated a total of 49 children who were diagnosed with PDA and had their PDA closed via transcatheter route in our department. In that study, PDA was diagnosed by the auscultation of a continuous murmur beneath left clavicula in physical examination and the visualization of ductus by transthoracic two-dimensional and color Doppler echocardiography. Ductal diameter and length were measured by aortography at left lateral position. The reviewed patients were grouped according to the size of the narrowest point of the ductus. The narrowest diameter of the ductus was detected to be <3mm in group I and ≥3mm in group II patients. The plugs were chosen according to the ductal morphology and size. The ductal closure was successfully performed by NitOcclud-pfm and Flipper coils introduced via transcatheter route in 91.8% of the patients in whom the narrowest ductal diameter was less than 5.5 mm (except two patients who had short-thick and long-tubular ducts). The success of the closure procedure was unaffected when the narrowest diameter of the ductus was either <3mm or ≥3mm. Flipper coils (ductal diameter: ≤3 mm) were preferred for the closure of small ducts while NitOcclud-pfm coils were chosen for the closure of large ducts (ductal diameter: ≥4mm). No case of distal embolization occurred in the patients who were treated with large coils.

As claimed by the authors, the detailed evaluation of the patient for PDA occlusion and appropriate coil selection is important (1). The present article demonstrates that Flipper coils are insufficient for the treatment of ducts with their narrowest diameters ≥4mm. Therefore,