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Znaczenie długości przedniego płatka zastawki mitralnej w operacyjnym leczeniu kardiomiopatii przerostowej.

Rozprawa na stopień doktora nauk medycznych

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Summary

Introduction.

Hypertrophic cardiomyopathy is the most common congenital heart disease and cause of death among young adults. Although it is caused by autosomal dominant mutations some patients may be asymptomatic throughout their life. Morphologically it appears as hypertrophy of myocardium most frequently in the basal interventricular septum. Even two thirds of patients may present itself with high gradient in left ventricular outflow tract at rest or after provocation. Elevated LVOT gradient is one of the sudden cardiac death risk factor and contributes to development of heart insufficiency symptoms. The mainstay of treatment are β-blockers and calcium channel blockers. Symptomatic patients despite pharmacological therapy and with elevated LVOT gradient over 50 mmHg are potential candidates for invasive treatment, surgical myectomy or percutaneous ablation. Because of predictable outcome of surgery and good long-term results surgical myectomy should be preferred over percutaneous intervention, which find its place among adult patients with prohibitive surgical risk. The majority of myectomies are performed through aortotomy. This approach enables acceptable visualisation of basal and in some cases mid-ventricular segments. Anterior mitral leaflet is also achievable in this modality. In over 97% of treated patients extended myectomy is sufficient surgical treatment. Recurrence of LVOT gradient occurs in about 6% of patients mostly because of insufficient resection of myocardium. To prevent this dismal and unforeseeable clinical outcome some HCM centers propose anterior leaflet reconstruction to minimise risk of SAM of usually elongated leaflet. Currently the most widespread techniques of AML reconstruction are plication or placing pericardial patch in A2 segment. There is a lack of direct comparison of this two concepts neither there is a lack of sufficient proof of its utility.

Hyphothesis and aim of the study.

Hypothesis 1.: Optimal LVOT gradient (< 30 mmHg) after extended myectomy cannot be predicted with imaging techniques nor clinical status.

Hypothesis 2.: Anterior mitral leaflet length does not impact the optimal result of surgical treatment of hypertrophic cardiomyopathy with extended myectomy.

The aim of the study is to analyse two group of patients with hypertrophic cardiomyopathy after surgical treatment with extended myectomy: with optimal (< 30 mmHg) and suboptimal (≥ 30 mmHg) gradinet in the left ventricle outflow tract and to look for factors that might predict the reduction of elevated LVOT gradient.

Material and methods.

We analysed 71 patients who suffered from HCM with LVOT obstruction and were operated on in The National Institute of Cardiology in Warsaw from 2012 to 2019. Hypertrophy was predominantly localised in basal segments and all patients were operated via aortic valve approach. Mitral valve insufficiency was preoperatively judged as functional due to systolic anterior motion of AML. We analysed echocardiograms performed before surgery and each done afterwards during hospital stay and ambulatory visits, in the same way we analysed clinical status recorded during medical visits. Each analysed MRI study was performed before surgery. Analysed variables were anterior mitral leaflet length, mitral annulus diameter, maximal LVOT gradient registred before surgery and during follow-up, the highest grade of mitral insufficiency registred before surgery and during follow-up, left ventricle end-diastolic and and-systolic volume, left ventricle mass and clinical status expressed as NYHA class. Patients were divided according to maximal LVOT gradient registred in follow-up into two groups: responders with gradient < 30 mmHg and patients who did not respond optimally with gradient ≥ 30 mmHg. Both groups were subsequently compared using above mentioned variables.

Results.

Significant drop in maximal LVOT gradient after surgery was noted in both, all analysed patients $p = 0,018$ and in subgroups: with optimal $p<0,001$ and suboptimal response $p<0,001$. The group of patients with LVOT gradient less than 30 mmHg had significantly longer anterior mitral leaflet $p=0,04$. After surgery significant improvement in NYHA class was noted in whole patients $p < 0,001$ and in subgroups: responders $p<0,001$, non responders $p<0,001$. Subjects in subgroups did not differ in NYHA class improvement before $p = 0,650$ and after surgery $p = 0,337$. There was a significant drop in the grade of mitral insufficiency $Z = 5,13$; $p < 0,001$. Patients with optimal response had lower end-diastolic volume indexed to BSA at baseline than patients with suboptimal decrease of gradient $p=0,03$.

Conclusions.

Patients with postoperative left ventricular outflow tract gradient less than 30 mmHg had longer anterior mitral leaflet and had lower end-diastolic volume indexed to BSA than those with LVOT gradient equal or more than 30 mmHg. Patients in analyzed groups did not differ significantly in term of NYHA class and grade of mitral regurgitation before and after surgery.