

ACUTE AND LONG-TERM EFFICACY OF PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY USING A PERIPHERAL CUTTING BALLOON AND AN ULTRA HIGH-PRESSURE BALLOON FOR PERIPHERAL ARTERY STENOSIS

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BACKGROUND

Percutaneous balloon angioplasty has been used to treat right ventricular outflow (RVOT) stenosis, but is complicated by a high rate of restenosis. Percutaneous cutting balloon angioplasty (CB) is an alternative approach that has been shown to reduce restenosis in adult hemodialysis access sites.

OBJECTIVE

The aim of this study was to compare the safety and efficacy of CB with that of ultrahigh-pressure balloon (Conquest®) angioplasty (CQ) in the treatment of RVOT stenosis in the acute and follow-up phases.

METHODS

Our center conducted a retrospective review of angioplasty performed with CB and CQ, using a balloon diameter ≤ 8 mm for RVOT stenosis, from January 2004 to October 2016. We examined the relationship between changes in MLD and the ratio of balloon diameter to MLD in the acute and follow-up phases. Differences in MLD before and immediately after PTA, before PTA and after follow-up, and immediately after PTA and after follow-up were defined as acute%MLD, post%MLD, and %restenosis, respectively, and were compared for the two groups. P -value < 0.05 was considered significant.

RESULTS

Fifteen patients (36 stenotic lesions) were classified into two groups according to the balloon used. Mean age at percutaneous transluminal angioplasty (PTA), body weight, minimal lumen diameter (MLD), and balloon diameter were 3.8 years old, 14.4 kg, 1.8 mm, and 5.3 mm, respectively. The follow-up period was 6.3 months. In the CQ group, 17 stenotic lesions were dilated using additional standard high-pressure balloons with diameter ≤ 8 mm. Changes in MLD were significantly correlated with the ratio of balloon diameter to MLD, regardless of the time period (acute%MLD: R^2 0.707, $P < 0.05$ vs, post%MLD: R^2 0.171, $P < 0.05$). There were no significant differences between the two groups in a comparison of MLD changes in the acute and follow-up periods. However, CB tended to result in a larger MLD than CQ in the follow-up period ($P = 0.19$, 100.8 ± 98.2 vs. 58.2 ± 68.0). CQ had a greater tendency toward restenosis than CB ($P = 0.1$, 34.0 ± 23.0 vs. 15.9 ± 32.5).

CONCLUSION

Angioplasty with CB had a lower tendency toward restenosis than CQ. Angioplasty with a CB may have an advantage over CQ by reducing vascular wall damage and restenosis.