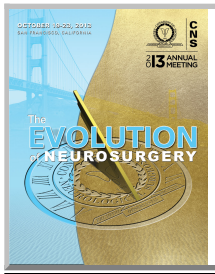

Minicraniotomy and Clipping for the Treatment of Noncomplex, Unruptured Anterior Circulation Intracranial Aneurysms is More Cost-Effective, Has Higher Obliteration Rates and Equivalent Safety to Endovascular Treatment

Christian Zweifel MD; Raphael Hillel Sacho; Ivan Radovanovic; Michael Tymianski MD, PhD, FRCS(C)

Introduction

Our purpose was to evaluate the outcome and cost-effectiveness of minicraniotomy versus endovascular procedures used to treat unruptured non-giant, saccular, anterior circulation aneurysms.

Methods

From 2005-2012, 209 consecutive patients with unruptured, non-giant, saccular, anterior circulation aneurysms were treated with clipping through a minicrantiotomy (102 patients) or endovascular (107 patients) techniques. Allocation to either treatment was by an interdisciplinary conference in which right of first refusal was given to the endovascular team. Thus, surgical patients were those deemed unsuitable for endovascular therapy. We evaluated patient demographics, aneurysm characteristics, obliteration rates, complications, clinical outcomes, length of stay and treatment costs.

Results

There were no differences in baseline demographics or mean length of stay. Mean aneurysm sizes were 6.8 mm in the minicraniotomy group and 7.9 mm in the endovascular group (p=0.011). More paraophtalmic aneurysms were treated endovascularly (54 vs 6, p<0.0001), but fewer MCA aneurysms (4 vs 60, p<0.0001). Minicraniotomy resulted in shorter anesthesia time (197.7 vs. 149.3 min, p<0.0001), higher rates of complete aneurysm obliteration (94.57% vs. 66.67%, p<0.0001), and lower overall hospital costs ($8,287 CAD vs. $17,732 CAD, p < 0.0001) as compared with endovascular treatment. There were no overall differences in clinical outcomes, but the study was underpowered to reveal such differences. In the endovascular cohort, two patients died due to treatment (mRS = 6) and one suffered a severe stroke (mRS = 5 at 6 months). There were no treatment related deaths in the surgical cohort, but one patient had a mRS of 3 after 6 months due to temporal lobe epilepsy and memory problems.

Conclusions

Minicraniotomy and clipping of unruptured, non-giant, saccular aneurysms of the anterior circulation that are unsuitable for endovascular therapy is as safe, results in higher obliteration rates and is more cost-effective than endovascular treatment of aneurysms deemed suitable for the latter.

Learning Objectives

Despite other reports in the literature, minicraniotomy and clipping is as safe and cheaper than coiling for noncomplex anterior circulation aneurysms.

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