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Coiling vs clipping in poor grade aneurysmal subarachnoid haemorrhage: A single centre analysis of outcome and complications

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DISCLOSURE

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INTRODUCTION

- Poor grade (WFNS Grade IV & V) ruptured aneurysms : approx. 30% of all cases of aSAH. Even with the optimal treatment, outcomes tend to be poor.
- **Post ISAT era** : coiling preferred over clipping. However incidence of poor grade ruptured aneurysms in ISAT : only 4.4%.
- Widespread clinical opinion, is that an early endovascular approach may lead to better outcomes for poor-grade patients possibly due to less delay to treatment and less procedural stress.
- Some clinicians even advocate for a aggressive medical therapy and selection of active intervention only in those who improve.
- These varying opinions often lead to management biases for poor-grade patients, making it difficult to assess comparative outcomes for alternative treatment arms.

METHODS

Retrospective analysis; 5 years (2014 - 2018)

INCLUSION

WFNS Grade IV & V aSAH

EXCLUSION

Improvement to better grade

Death before treatment/ refusal / medical mx

Delayed surgery > 21 days

Aggressive resuscitation, ICU, CT angio/DSA, Early treatment

OUTCOME MEASURES

- Modified Rankin scale used.
- mRS score dichotomized as good (0-3) & poor (4-5)
- 1^o outcome : functional outcome at discharge, 3 & 6 months
- 2^o outcome : postoperative complications

RESULTS

CLINICAL VARIABLES

VARIABLES	COILING (N=25)	CLIPPING (N=63)	TOTAL	P VALUE
AGE : MEAN (SD)	56.2 (12.74)	54.19 (11.28)		0.46
MALE	7	21	28	0.80
FEMALE	18	42	60	
WFNS GRADE				
GRADE IV	17	57	74	0.01
GRADE V	8	6	14	
MOD FISHER				
GRADE I-II	6	12	18	0.57
GRADE III-IV	19	51	70	

VARIABLES	COILING (n=25)	CLIPPING (n=63)	TOTAL	P value
HEMATOMA	7 (28%)	28 (44.4%)	35	0.22
INFARCTS	4 (16%)	7 (11.1%)	11	0.49
HYDROCEPHALUS	10 (40%)	28 (44.4%)	38	0.81
TIMING OF SURGERY				
<72 HOURS	11 (44%)	15 (23.8%)	26	0.20
>72 HOURS	14 (56%)	38 (60.3%)	52	
INTRA OP RUPTURE	2 (8%)	15 (23.8%)	17	0.13
SMOKING	9 (36%)	18 (28.5%)	27	0.60
HYPERTENSION	14 (56%)	36 (57%)	50	0.32
CARDIAC AILMENT	12 (48%)	13 (20.6%)	25	0.01
MULTIPLE ANEURYSMS	4 (16%)	2 (3.1%)	6	0.05

COMPLICATIONS ASSOCIATED WITH COILING & CLIPPING

COMPLICATION	COILING	CLIPPING	ODDS RATIO	P VALUE
ANEURYSM REBLEEDING	2	0	-	-
CEREBRAL INFARCTION	3	9	0.81(0.20-3.30)	0.77
VASOSPASM	3	14	0.47 (0.12-1.83)	0.28
HYDROCEPHALUS	6	5	3.6 (1.00-13.37)	0.04
SEIZURE	1	4	0.61 (0.06-5.78)	0.67
PNEUMONIA	7	21	0.77 (0.28-2.15)	0.62
ELECTROLYTE DISTURBANCES	3	7	1.09 (0.25-4.60)	0.90
MENINGITIS	-	3	-	-

OUTCOMES OF PATIENTS TREATED FOR POOR GRADE aSAH

OUTCOMES	COILING	CLIPPING	ODDS RATIO	P value
AT DISCHARGE			2.83 (1.02-6.8)	0.04
mRS (0-1)	3	4	2.01 (0.41-9.71)	0.38
mRS (2-3)	7	8	2.72 (0.86-8.55)	0.08
mRS (4-5)	11	40	0.45 (0.17-1.15)	0.09
Dead	4	11	0.90 (0.25-3.14)	0.86
LOST TO FOLLOW UP	1	3		
AT 3 MONTHS			1.69 (0.64-4.44)	0.28
mRS (0-1)	4	8	1.30 (0.35-4.8)	0.69
mRS (2-3)	7	12	1.64 (0.55-4.86)	0.36
mRS (4-5)	7	25	0.57 (0.20-1.59)	0.28
Dead	6	15	0.64 (0.22-1.85)	0.41
AT 6 MONTHS			1.44 (0.55-3.73)	0.44
mRS (0-1)	5	11	1.17 (0.35-3.82)	0.79
mRS (2-3)	8	16	1.37 (0.49-3.82)	0.54
mRS (4-5)	5	16	0.72 (0.23-2.26)	0.57
Dead	6	17	0.84 (0.28-2.48)	0.75

DISCUSSION

- The demonstration of good outcomes in 46% of poor-grade patients in this study is similar when compared against most published SAH studies.
- Our study observes increased trend of radiological & clinical hydrocephalus in the coiling group as open surgery involves clot removal & cisternostomy resulting in less hydrocephalus.
- In our study, the incidence of vasospasm was significantly lower in the patients who underwent coiling. The degree of vasospasm may be attributed to the amount of blood in the subarachnoid space, clearance of blood by surgery (positive impact), and manipulation of vessels during surgery (negative impact).
- At discharge, a significantly better outcome was observed after the coiling procedure. However, there was no significant difference in the mortality and outcomes (mRS) at 3 & 6 months between the clipping and coiling groups.

SUMMARY POINTS

- With an aggressive early treatment policy approximately half of the poor-grade SAH patients demonstrated a good clinical outcome.
- Clipping and coiling being complementary, treatment should be individualized based on clinical presentation and aneurysm characteristics.
- No significant differences in functional outcome were noted between two arms in long run.
- The risk of symptomatic vasospasm was higher after clipping while that of hydrocephalus was higher after coiling.