

Role of Endovascular Approach in Management of Intracranial Dissecting Aneurysms

Thesis Protocol

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Summary

The goal of treatment in intracranial dissecting aneurysm is elimination the hemorrhage risk through preventing or reducing the amount the circulating to pass at the dissected segment.

Diagnosis of intracranial dissecting is challenging due to the small size of intracranial arteries and the subtle and non-specific radiological signs, which tend to develop with time. However, in our institute we have diagnostic criteria on which we based our study:

❖ **The direct signs include:**

- I. Intimal flap or double lumen sign that appears in angiography or MRI.
- II. Mural thrombosis which appears in MRI as semilunar bright T1 signal around dark signal void associated with arterial wall enlargement. It appears within 48 to 72 hours from the onset.

❖ **The indirect signs include:**

- I. Segmental fusiform or irregular dilation & stenosis non-branching site (pearl and string sign).
- II. Segmental fusiform or irregular dilation only at non-branching site (pearl sign) associated with subarachnoid hemorrhage or retention of contrast within the aneurysm in late arterial phase

Endovascular treatment of intracranial dissecting aneurysm has been the first line of as endovascular treatment is minimally invasive therapeutic approach and spares the patient some of the hazards associated with craniotomy and open surgery.

There are two main endovascular treatment methods:

I. Deconstructive technique in which the patent artery is occluded via:

- ⇒ Proximal arterial coiling.
- ⇒ Aneurysmal trapping “proximal & distal occlusion of the artery with coils”
- ⇒ Aneurysmal packing with proximal arterial occlusion

II. Reconstructive method in which the artery is preserved via:

- ⇒ Selective aneurysmal coiling.
- ⇒ Stent assisted coiling
- ⇒ Flow diverter stents.

Our plan of treatment is complicated and affected with multiple overlapping factors, but mainly it depends on the clinical presentation and the onset at which the patient sought for treatments as well as the site of the lesion and collateral supply.

a. If the patient present with subarachnoid hemorrhage:

- ⇒ In the acute stage, the patient will be treated through parent artery occlusion if there is good collateral supply. However, in case of poor collateral circulation or site of the lesion involving major branch we may tends to artery preserving technique through selective aneurysmal coiling only to be followed later on with stenting. Stenting in acute stage shouldn't be done as the patient will receive double anti-coagulant although the high risk of fatal rebleeding (80%). Also, stenting will not offer acute occlusion of the aneurysm it just slows flow within and complete thrombosis will be achieved within few months.
- ⇒ In subacute stage, our first line of treatment is stenting, however stenting may be difficult due to loss of normal arterial architecture or distally located segment, so the patient will be shifted to the deconstructive method.

b. If the patient present with non-subarachnoid hemorrhage:

The main line of treatment is artery preserving technique via stenting, however stenting may be difficult due to loss of normal arterial architecture or distally located segment, so the patient will be shifted to the deconstructive method.

There adverse effects were reported in our study for each type of treatment (e.g. ischemic manifestation due to parent artery occlusion and delayed rebleeding in selective aneurysmal coiling without stenting).

In general, the morbidity & mortality rates in both treatment methods were much better than that reported in the literature.

Also, our study showed that our functional outcome was excellent, almost all cases treated with endovascular management had final outcome (mRS 0-1). Also, there is statistically significant improvement with clinical outcomes after three months of intervention, which indicated increase in percentage of cases with no disability from 20.8% to 60.9%, which indicated improvement of cases.