



## **Curriculum**

**Postdoctoral fellowship training program**

**(Cerebrovascular Surgery)**

**Department of Neurosurgery**

**Sree Chitra Tirunal Institute for Medical Sciences and Technology**

**Thiruvananthapuram, India**

**(An Institution of National Importance, Department of Science and Technology, Govt. of India)**

## **Curriculum for Post-Doctoral Fellowship in Cerebrovascular Surgery**

### **Introduction:**

Cerebrovascular neurosurgery is a sub-specialty of neurosurgery which deals with diagnosis, evaluation and management of vascular lesions of the brain. Lesions include cerebral and skull-base aneurysms, arteriovenous malformations, cavernomas, Moyamoya disease, dural arteriovenous fistula. In addition, cerebrovascular surgical skills are an important component of skull-base lesions. These lesions pose special challenges owing to the possibility of catastrophic bleeding occurring during surgery. The surgical management of such lesions requires identifying key anatomical landmarks, understanding the surgical anatomy of the surgical corridor while minimizing surgical morbidity and complications. Skull base surgery has also been transformed by the use of advanced C-arm for intraoperative DSA and ICG angiography. for managing a variety of skull base pathologies. This subspeciality involves specialized training in blood vessel handling, dissection techniques, use of vascular clips and surgical safety.

SCTIMST offers one fellowship position in Cerebrovascular Fellowship every year.

### **Background**

India has over 2000 neurosurgeons currently practicing. However, majority of them are practicing general neurosurgery. Due to challenges and specialized skill requirement, cerebrovascular surgeries are limited to a few centers in country. Without a formal training in this specialty, few neurosurgeons venture to treat cerebrovascular lesions. Most of the cases are either referred to the bigger centers or are inadequately managed. The bigger centers are far and few, delaying the management of these lesions. There are very few centers in India who offer formal training in complex cerebrovascular surgery.

SCTIMST is a tertiary care institution of national importance operating under the Ministry of Science and Technology. The institute receives referrals from states in South India including Kerala, Karnataka, TamilNadu and Andhra Pradesh as well as from many other states of India. At present, very few neurosurgeons possess formal training in the sub-specialty of Cerebrovascular neurosurgery with an adequate exposure in managing complex cerebrovascular pathologies as well as an all-round training in microneurosurgical and microvascular anastomosis techniques. SCTIMST is a tertiary care referral centre for management for cerebrovascular pathologies like cerebral and skull-base aneurysms, arteriovenous malformations, cavernomas, Moyamoya disease, dural arteriovenous fistula etc.

## **Curriculum**

After 1 year of training the candidate should be able to

- (a) Be well versed with the clinical presentation, diagnosis, investigative procedures required for the diagnosis and surgical treatment of all kind of vascular lesions of the brain and spinal cord. Be fully aware of all associated complications and their management, indications for surgery and postoperative management strategies.
- (b) Classify and categorise all types of stroke, stroke in evolution, TIA's etc. should be familiar with the clinical presentation and diagnosis, aetiopathogenes of haemorrhagic and ischemic stroke, carotid artery disease and indications for surgery in these patients. He should be fully aware of the surgical Vs endovascular management, post-operative management, recognition of complications and their management. He/she should be able to take clinical and scientific decisions on decompressive craniectomy for stroke.
- (c) Indications of cerebral bypass procedures, cerebral revascularization, diagnosis and clinical presentation of Moyamoya disease, definition and pathophysiology of Moyamoya, diagnostic presurgical work up required, indications of STA-MCA by pass other bypass procedures for anterior as well as posterior circulations, indication and techniques for skull – base bypass.
- (d) Clinical presentation, natural history and pathophysiology of hypertensive bleed; indications for surgical/non-surgical management, surgical options, complications and management

## **Course content**

### **Diagnostics**

Imaging modalities are part of training and the candidate should be aware of the latest developments in imaging techniques related to skull base. The candidate should be able to give a radiological differential diagnosis on DSA, CT, MRI and is required to assess for the additional investigations. Regular discussion with neuroradiologists is recommended with feedback. The indications for endovascular intervention versus surgical management need to be understood by the fellow.

### **Clinical work**

The curriculum includes participation in the clinical diagnosis, pre-operative assessment, operative steps, and postoperative management of patients with cerebrovascular lesions including, complex aneurysms located at the cranial base. He/she will perform clinical pre-

procedural evaluations of patients, interpret preliminary diagnostic studies, consult with clinicians on other services, generate procedural reports, and participate in short-term and long-term post-procedure follow-up care, including neuro-intensive care.

### **Operative planning**

The candidate needs to plan the surgery and present his views to the consultant in-charge of the case. This is an important part of the training. If the plan does not match with consultant's plan; the reasons should be noted.

### **Presentation**

Will include seminars, journal clubs and symposia's, bedside teaching of residents at all levels

### **Academic contributions during fellowship**

Must publish two original articles/research articles. The articles should have been accepted or published in indexed national or international journals. The project proposal should be materialized into a thesis which should be published in indexed journals.

Before the completion of course the candidate be well able to:

1. Clip simple aneurysms in anterior circulation
2. Excise simple AVMs and Cavernomas
3. Complete microvascular anastomosis training
4. STA-MCA bypass subject to objective 3.

### **Evaluation/Exit examination**

The log book and progress would be assessed at 6 monthly intervals. At the end of one year, the candidate will be evaluated for skills acquired in making clinic- radiological diagnosis and operative planning.