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Scope and Significance of Mechanical Thrombectomy in Resource-Poor Settings: Bangladesh Perspective

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Stroke remains one of the leading causes of death and disability in Bangladesh, accounting for a significant proportion of the national burden of disease[1]. According to the Bangladesh Bureau of Statistics and WHO estimates, stroke affects nearly 1 in every 500 people annually, with higher incidence in rural areas[2]. As the country experiences epidemiological transition, the burden of non-communicable diseases, including stroke, continues to rise. Among ischemic strokes, large vessel occlusions are associated with severe neurological deficits and higher mortality. Mechanical thrombectomy, a revolutionary intervention for acute ischemic stroke due to large vessel occlusions, has become the standard of care in many high-income countries[3]. Yet, in resource-poor settings like Bangladesh, this life-saving procedure remains largely inaccessible. Understanding the scope, feasibility, and strategic significance of mechanical thrombectomy in such settings is crucial for bridging the gap in equitable stroke care[2].

Mechanical thrombectomy involves the removal of a thrombus from a cerebral artery using devices such as stent retrievers or aspiration catheters. Since the landmark trials-MR CLEAN, EXTEND-IA, SWIFT PRIME, DAWN, and DEFUSE 3-MT has been validated as a highly effective therapy for acute ischemic strokes involving LVOs, particularly when administered within a time window of 6 to 24 hours in selected patients[2]. These studies showed dramatic improvements in functional independence and reductions in long-term disability. Furthermore, the use of advanced imaging (CT angiography and perfusion imaging) has refined patient selection criteria, enabling more precise and individualized treatment decisions. In many developed health systems, MT is now routinely offered in designated comprehensive stroke centers, often in conjunction with intravenous thrombolysis.

There is a huge burden of stroke and there are several limitations health system in Bangladesh. Bangladesh, a lower-middle-income country with a population exceeding 170 million, is facing a dual challenge: a growing incidence of stroke and limited capacity to deliver time-sensitive neurological interventions. The majority of strokes in Bangladesh are ischemic, and a significant portion are large vessel occlusions that could potentially benefit from thrombectomy. However, the absence of nationwide stroke surveillance, inadequate emergency transport systems, delayed recognition of symptoms, and scarcity of specialized stroke centers hinder timely diagnosis and treatment.

Currently, only a handful of urban, private tertiary care facilities offer mechanical thrombectomy, often at high costs that are unaffordable for the general population. Public hospitals, which serve the majority, lack the infrastructure, trained neurointerventionists, and endovascular equipment required to perform MT. Moreover, neuroimaging capabilities-specifically CT angiography and perfusion imaging-are limited, especially outside major metropolitan areas. Our pharmaceutical companies are very efficient. So they could try to make the instrument needed for MT. It will reduce the cost dramatically.

Mechanical thrombectomy is crucial for Bangladesh. Introducing MT into the mainstream stroke care pathway in Bangladesh is not only medically justified but also economically and socially significant. Unlike thrombolysis, which is often constrained by a narrow time window and contraindications, MT offers a broader therapeutic window and higher efficacy in large vessel occlusions cases.

Bangladesh has a relatively young stroke population compared to high-income countries. Stroke often affects individuals in their productive years, leading to long-term disability, dependence, and economic loss for families and society. Mechanical thrombectomy, by preventing disability in eligible patients, could

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significantly reduce the national burden of post-stroke rehabilitation, improve quality of life, and support economic productivity. The government has imposed huge taxes on MT related instruments. So it has become expensive. Taxes should be omitted. It's a life saving procedure. So it should be a priority on policy.

Furthermore, as awareness about stroke grows and pre-hospital triage improves, the number of patients reaching hospitals within the MT window is expected to increase. Thus, expanding access to thrombectomy is a logical step toward building a responsive and inclusive stroke care system.

Feasibility of Implementation should be explored and the opportunities as well as the challenges need to explore. While resource limitations pose undeniable challenges, several opportunities exist to integrate mechanical thrombectomy into Bangladesh's health system[3]. Development of Stroke-Ready Centers is essential. Selected public and private hospitals could be upgraded into regional stroke hubs equipped with CT angiography, interventional suites, and dedicated stroke teams. These centers can act as referral bases within a hub-and-spoke model for stroke care. Role of training and capacity building is very crucial. Investing in the training of interventional neurologists, neuroradiologists, and related personnel is critical. Short-term fellowship programs and twinning arrangements with international stroke centers can accelerate skill development. Cost-Effective Procurement and Public Financing are important factors. Mechanical thrombectomy devices are expensive, but cost-minimization strategies-such as pooled procurement, negotiations with device manufacturers, and inclusion in public health insurance-can improve affordability. Task-shifting and cross-specialty training are important. Development of national guidelines and policy support are very important as well. The inclusion of MT in national stroke management protocols, along with clear guidelines for patient triage, transport, and referral, would support systematic implementation. Public-private partnerships and donor support are also crucial. Collaborative models involving government, private health providers, non-profits, and international donors can fund pilot projects, build infrastructure, and develop training platforms.

Equity in access is a critical concern. MT services must not be limited to affluent urban populations. To this end, integrating mechanical thrombectomy into the public health sector is essential. It will require not only infrastructural investment but also community-level awareness programs to ensure that stroke symptoms are recognized early and appropriate actions are taken[3]. Ambulance services must be trained in stroke triage, and referral pathways must be optimized to reduce door-to-needle and door-to-groin times. Furthermore, implementing a national stroke registry can help in monitoring outcomes, identifying gaps, and refining strategies. Health technology assessments and cost-effectiveness studies tailored to the Bangladeshi context would guide future policy decisions. In our country we have cathlabs in each division. Only trained manpower can start it in a divisional area. Because due to huge traffic and poor communication its difficult to reach Dhaka within a defined time.

Mechanical thrombectomy represents a game-changing advancement in stroke care, offering hope to patients with large vessel occlusions who were previously left with devastating outcomes. In Bangladesh, the introduction and expansion of MT services must be seen as a public health imperative. Though challenges related to infrastructure, training, and financing exist, they are not insurmountable. Strategic planning, investment in capacity-building, public-private collaboration, and evidence-based policymaking can collectively make thrombectomy accessible to the wider population. As stroke incidence rises, embracing mechanical thrombectomy is no longer a luxury for Bangladesh-it is a necessary evolution toward equitable, modern, and life-saving stroke care.

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