

Kazi Mobin-Uddin

Surgeon-Researcher Extraordinaire. Father of Endovascular Surgery



Few people, in the course of their professional work, break new ground and usher in a whole new field in the area of their specialization. Kazi Mobin Uddin was one such person.

Using his insatiable curiosity and his sharp intellect, Dr. Uddin did what to many generations of surgeon-researchers had appeared impossible. He thought outside the box and laid the foundations of the new discipline of endovascular technology. To put his work and his achievements in perspective one has to look into the background of this humble and unassuming Muslim man from Pakistan.

Kazi Mobin-Uddin was born on July 16, 1930, in Skindarabad, India and received his early education at the Aligarh Muslim University. In 1945 his family moved to Lahore where his father had accepted a position as professor and chairman of geography department at the University of Punjab. After attending Forman Christian College in Lahore he entered the prestigious King Edward Medical College in the same city and graduated with a MBBS in 1954.

The quest for post graduate education and training in surgery brought him to the United States in 1957. He received general surgery training at St. Vincent's Hospital in Jacksonville, Florida and thoracic and cardiovascular surgery training at Memorial Hospital in Miami. After finishing his formal training he

joined the faculty of the University of Miami as an assistant professor. It was at that institution in Miami that he conceived the idea of inferior vena cava filter that would bring him worldwide fame.

Pulmonary embolism has been the bane of medical profession for a long time. In 1908 the famous German surgeon Friedrich Trendelenburg attempted the first unsuccessful pulmonary embolectomy.¹ Sixteen years later in 1924 another German surgeon Martin Kirschner performed the Trendelenburg operation, this time with success.² Though it was a heroic and daring operation, it remained beyond the repertoire of an average practicing surgeon.

By the early 1950s the emphasis had shifted from operating on the pulmonary artery to retrieve already embolised clots to preventing the migration of clots to the lungs. This meant interruption of blood flow through the inferior vena cava by either ligating the cava or plicating it with sutures or a plastic clip. Innovative as those procedures were, they still required the administration of general anesthetic and an open operation in very sick patients. It was Mobin-Uddin's genius to conceive a method where the inferior vena cava could be interrupted by passage of a filter through the jugular vein by making a small incision in the neck under local anesthesia.

It always takes courage and vision to accomplish something that goes against conventional wisdom. In 1929 Wener Theodore otto Frossman³, a German physician demonstrated, on himself, that a catheter could be safely introduced thorough an arm vein into the heart. It took another 30 years to demonstrate that various heart chambers could safely be catheterized and coronary arteries injected with radio opaque dyes. But no one had ever demonstrated that a permanent device could be left across the venous flow without much consequence.

Dr. Mobin-Uddin developed his umbrella-shaped inferior vena cava filter in the animal lab of the

University of Miami. (I often joked with him that he should call his filter an umbrella-with-holes, otherwise we might have to change the definition of umbrella.) The umbrella allowed the blood to flow through the perforations but trapped clots that would otherwise travel to lungs. Simply put the umbrella allowed the rain to go through but stopped the hail. After demonstrating its feasibility in animal models and then in the clinical setting he presented his work at the clinical congress of the American College of Surgeons in the fall of 1967. That short paper presented at the prestigious research forum not only garnished for him the Young Investigators' Award but also catapulted him to a worldwide fame. Subsequently he published his landmark paper in *American Surgeon*⁴. *Newsweek* magazine reported the discovery in its October 20, 1969 issue under the heading *Umbrella of Life*. In a rare expression of pride in one of its prodigious sons, the Government of Pakistan conferred on him the prestigious civil award of *Sitara-e-Imtiaz* in 1970.

Through the seventies Uddin Umbrella Filter was the only device for the prevention of pulmonary embolism. But it did not take long for others to jump in and devise filters of different designs and configuration using alternate materials. In time the original Uddin filter was swept aside and became obsolete.

Obsolescence of a device is one thing, delegating a brilliant idea to obsolescence is quite another. Though future researchers continued to improve on the design of the original filter, they also began to minimize Uddin's contribution in the field of thromboembolism. In 1994 James DeWeese, a respected vascular surgeon gave his presidential address on great innovations of the past century in the treatment of venous diseases to the American Venous Forum. In his address and subsequent published version⁵ he minimized the seminal contribution of Mobin-Uddin in the field of thromboembolism. Dr. Patrick Cain of Columbus, a radiologist, took exception to this oversight in a letter to the editor of the *Journal*⁶. He maintained that since Mobin Uddin's idea had ushered in the burgeoning field of intaluminal vascular interventions, he is rightfully the father of endovascular technology. After his death I wrote a tribute to him for the *Journal of Vascular Surgery* in which I reiterated the

sentiments expressed by Dr. Cain and others.⁷

Though Dr. Mobin-Uddin made many other significant contributions in surgery, his inferior vena cava filter overshadowed his other work and he was forever referred to as the *Umbrella Man* in scientific circles. He studied and reported on diverse topics such as experimental myocardial infarction, surgical interventions to treat ischemic heart disease, use of internal mammary artery for coronary revascularization, use of implantable heart pacemakers and mechanism of pulmonary complications after acute pancreatitis. Most of this work however antedated his work on the umbrella filter.

He was a prolific writer. He edited one book on thromboembolism and wrote chapters in six other medical texts. In addition he published 61 research papers in peer-reviewed scientific journals.

During his surgical career he had held many academic appointments. From the University of Miami, where he had started his career, he moved to the University of Kentucky in Lexington. From Lexington he went to the Smith Clinic in Marion, Ohio as chief of thoracic and cardiovascular surgery and finally to Columbus, Ohio where he joined the clinical faculty of The Ohio State University.

I first met Dr. Uddin in the late sixties in one of the national surgical meetings where he had presented his work on the umbrella filter. With reluctance and much trepidation I approached him to introduce myself. He won me over with his infectious friendliness and his down to earth demeanor. We continued contacts through the years and I was privileged to collaborate with him in clinical evaluation of his filter. In 1980 when I presented my experience with the Uddin Filter at the International Surgical Congress in Mexico City, it was not the study that drew attention of the large audience but the fact that I personally knew the man behind the filter. It was a true case of me basking in the deflected glory of Mobin-Uddin.

At my request he came to the Medical College of Ohio as a visiting professor and I reciprocated by visiting his institutions to discuss my work on extra anatomic arterial bypasses and pleuro-peritoneal

shunts. We often called each other to discuss the finer points of those procedures.

Each time I met Mobin (contrary to common perception Mobin and not Kazi was his first or given name), I learned a bit more about this very interesting man. During one of the scientific meetings in Washington a few years ago he took me to Food Factory, an Afghan restaurant in suburban Virginia. Over a sumptuous meal of Afghan/ Pukhtun fare we talked about a million things. And then he let out a surprise. He told me that he wrote Urdu poetry. At my insistence he shared a few of his poems with me. It was refreshing to see his excursion into the realm of literature and the joy it brought to him.

We last met in Lahore, Pakistan during the scientific meeting of the Association of Pakistani Physicians of North America in 1997 where we shared the scientific forum and had a chance to catch up on the happenings. He gave an update on his technique of preventing intimal hyperplasia in vascular anastomosis. It was always enjoyable to see him, listen to him and bounce uncooked and raw research ideas off of him.

It was his soft-spoken nature, his quiet approach to science and his lack of penchant for self-promotion that prevented him from seeking high office in prestigious thoracic and vascular societies. He kept his membership in those organizations current, attended meetings, presented his work without fanfare and kept clear of the organizational politics. In the end it was not his loss but the loss of those societies.

With finesse and dexterity he balanced the life of a surgeon-researcher with that of a devoted family man and an active member of the Ohio Muslim community. In all his efforts he had the support of his gynecologist wife Saeeda. Together they raised four children, Asma, Omar, Attiya and Iffat. Asma and Omar are practicing physicians in Columbus, Ohio.

In the mid 1990s he was diagnosed with colon cancer. Through the long and painful ordeal of surgeries, radiation and chemotherapy he kept his spirits high and accepted the inevitable with patience and fortitude. He died in the presence of his family on June 12, 1999.

Mobin-Uddin was a kind and gentle man. Perhaps

the words of Wordsworth describe him well:

That best portion of a good man's life
His little nameless, unremembered acts
Of kindness and love.

William Wordsworth, *Tintern Abbey*

In an unassuming way he ushered in a quiet revolution in the ever-expanding field of endovascular surgery. When the history of great innovations in surgery is written, Kazi Mobin-Uddin will surely be given the recognition he rightfully deserves.

References

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