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HISTORY

The Great Neurosurgeon and Spinal Surgery
Atul Goel—A Neurosurgical Genius

INTRODUCTION

Every significant advance in science has issued from a new audacity of imagination

–John Dewey

Atul Goel

"Throughout the centuries some men took first steps down new roads with nothing but their own vision." This quote by Ayn Rand very aptly suits the persona of Dr. Atul Goel. I would like to call him the *John Galt* of neurosurgery. His "out of the box" concepts and ideas have revolutionized many a neurosurgical practice. A neurosurgeon par excellence, Dr. Goel is a unique combination of science and philosophy rolled in one.

Early Years

He was born in Chandigarh but spent most of his growing years in Nagpur, which he likes to call his hometown. He is the youngest of three brothers and as is true of all youngest siblings is the family's favorite. He finished his medical schooling in Nagpur Medical College following his eldest brother's footsteps. But that was where the shadowing ended. After finishing medical school, he had a short stint at a law school and a sudden wild idea of entering politics. But destiny called him, and he joined Neurosurgery at the Topiwala Nair Hospital, Mumbai under the tutelage of Dr Vengsarkar. He often reminisces about his family and friends reaction on his joining Neurosurgery. He was told: Are you crazy? Half the patients in neurosurgery are unconscious by the disease and the other half become unconscious after surgical intervention. But his foothold was strong and conviction even stronger, and he has paved on to become one of the legends of Neurosurgery.

He finished his early couple of years at Nair Hospital and then joined the Seth G.S. Medical College and K.E.M Hospital. He became a Lecturer there in 1986, Associate Professor in 1995 and Professor in 1999. By a stroke of good fortune, h e suddenly became the Head of Department of Neurosurgery in 1998 and a world of opportunities opened up to him.

The Innovator and Scientist

Heights by great men reached and kept
Were not attained by sudden flight
But they when their companion slept
Were toiling upward in the night

From his early years, he has been fascinated with the anatomy of the nervous system, and this led him to pursue cadaveric dissections. This was not an easy task as there were no state of art anatomical laboratories available at the time in our country as are seen now. The dissections were carried out at an ungodly hour in the middle of the night. First, the mortuary worker was taken into confidence, then instruments were procured by cajoling and persuading and then the training microscope was wheeled from the department to the mortuary. The rigmarole continued for several years and ultimately the results began to show. Even as a young resident he had published several technical notes that are still referred to today.

Dr. Goel always likes to say, "Never underestimate the young creative mind of a resident or a junior colleague." Dr. Goel had just finished his M.Ch. Neurosurgery and his astute mind invented the technique that has revolutionized present day craniovertebral junction surgery. The technique initially received vehement objections from his peers and seniors and was criticized. But ultimately it stood the test of time and now is the gold standard for treatment of

cranio vertebral junction alterations, and he is now known as the "Father of modern craniovertebral junction surgery." He was awarded the Indian Council of Medical Research National Award twice in 1995 and 1996. He has 200 original techniques credited to his name. He has been elected as the President of the Neurological Society of India for the year 2019. The innovations have still not stopped, and his mind keeps on churning new concepts and techniques.

The Philosopher

Science is what you know, philosophy is what you don't know.

–Bertrand Russell

He has been deeply influenced by the ideology, anatomical and philosophical teachings of Dr. Manu Kothari who he calls his "Guru". I have often heard him say to Dr. Kothari; "Are you there in your office Sir? I am coming to lie down at your feet" when he would want to meet him. Dr. Kothari introduced him to the world of teleology. "In Nature, there is no Terror of Error." This changed his philosophy and practice of neurosurgery. This influence led him to establish a new unique school of neurosurgery. These concepts have led to the establishments of more modern approaches to almost all regions of the skull base (BOSS). His philosophical contributions on meninges, cavernous sinus, hydrocephalus, tumors to name a few are widely read and are a subject of great interest. Based on this he devised extradural approaches to lesions in the cavernous sinus and proposed a classification and treatment for giant pituitary adenomas. His contribution to skull base surgery has revolutionized surgery on cavernous sinus tumors, pituitary tumors, suprasellar meningiomas, epidermoid tumors of the brain, petroclival tumors, chordomas, foramen magnum tumors, acoustic neurinomas and trigeminal neurinomas just to name a few. Essentially the entire field of skull base neurosurgery has his signature firmly and strongly inscribed on it and his concepts have had a path breaking impact on the entire discipline. In an era where MRI had just arrived, and clinicians were attempting to diagnose various pathologies based on their characteristics, Dr. Goel identified pathologies based on displacements of vascular structures and membranes and thus selected the best approach to the lesion. Before planning on a complex case, he is known to stare at the MRI films of the patient for hours on end, thinking of the best strategy and creating a three-dimensional model in his head. The entire surgery was rehearsed in his conscious and subconscious mind before embarking on it. And just as fortune favors the brave, he was rewarded by remarkable surgical results and patient satisfaction. He has been recognized for his neurosurgical philosophy and is an honorary member of various international neurosurgical societies and a visiting professor to many well known academic Institutes throughout the world.

The Neurosurgeon Artist

Every science begins as philosophy and ends as art

– Will Durant

" I went to the bathroom and when I was back the tumor was out." This has been the experience of many a young neurosurgeon who visits the department to watch the master perform. Watching him operate is like watching a magician perform his feat. The nerves and the vessels miraculously seem to part to make way for him to attack the tumor and remove it. His fellows and observers are awestruck when they see him perform a huge acoustic in an hour, a pituitary tumor in 15 minutes and a C2 neurinoma in 7 minutes to name a few. Despite the speed, the surgery is performed with finesse and style and with remarkable results. I will narrate an incident that happened at our theatre. Everyone over the world uses facial nerve monitoring for acoustic neurinomas. So we decided to monitor the facial nerve when Sir was operating on an acoustic tumor. Everything was set up, and the surgery began, and at the end of an hour, Dr Goel asked for the facial nerve monitor. He stimulated a region in the surgical field, and the neurophysiologist happily exclaimed "Yes that's the facial nerve" This went on for a few minutes. Then Sir suddenly announced ok let's close. The neurophysiologist came up to him confused; I thought you just identified the facial nerve, and now you are closing. We all burst out laughing. The entire tumor had been removed with facial nerve preservation, and the probe was just used at the end to show that the nerve was indeed intact!!

All said and done; if you ask Dr Goel about the speed of his surgery, he will say: it is not speed but the art that matters and most important is the clinical outcome of the patient. Like the residents, the patients admire him for his unique and personal concern for each one of them.

The Teacher

A true teacher is not one who is inspired but one who inspires others

Dr Goel has a persona that is full of enthusiasm, warmth, and vigor that infuses dynamism in all his students with all aspiring to emulate him. His approach to neurosurgery is very simple. His two important dictums are: "Never operate on an improving patient and likewise never operate on an asymptomatic patient." This has great im plications in the practice of the precision art of neurosurgery. He likes to make "Neurosurgery look simple" so that even a young novice watching him feels like he can do it. The most important decision is made in the outpatient department when the surgeon decides on operating on the patient. With this decision comes great responsibility. Sir likes to say: Once a tumor always a tumor. You are not here to cure the disease that can never be in your hands; you are here to alleviate the patient's symptoms. So aim to remove the tumor as radically as possible but within the premise of safety. He has mentored many national and international fellows. He has been awarded the prestigious Dr. B.C Roy eminent teacher award in Neurosurgery.

The Writer and Orator

Creativity is intelligence having fun

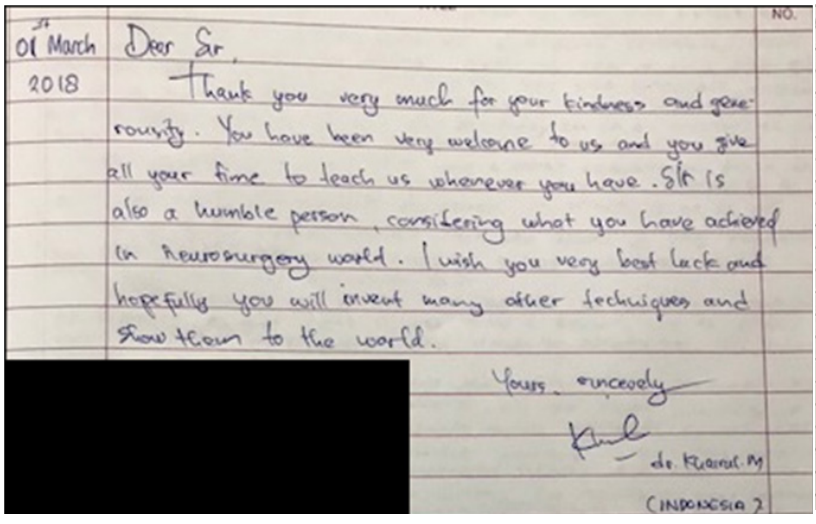
–Einstein

He is a prolific writer, he loves to write and put his ideas into words. There are times when he has dictated an entire paper on the phone without any literature search or reading. Then you have to hunt for references to make the article complete. He has more than 600 publications in national and international journals. His first book "*Neurosurgery of Complex tumors and vascular Lesions*" was written when he was just a young lecturer and the uniqueness of this book is that all of the techniques and approaches described in his chapters are his original inventions. Two of his articles have been included in the *'The hundred most influential publications in cervical spine research.'* –Publication in *Spine* 2016. And five of his articles are included in *Highest cited 100 papers* published in *Neurology India*. - Publication in *Neurology India* 2016. He is on the Editorial board of all the prominent Neurosurgical journals and has been the Chairman of the Journal of Neurosurgery – Spine. He is the only non-North American Neurosurgeon to have been awarded this honor.

He is a captivating orator and leaves his audience both young and old neurosurgeons enthralled by his experience, ideas, and humor . He can talk on any aspect of neurosurgery hours on end and still keep his audience captivated. His talks can awaken and stimulate a sleeping audience. There is never a dull moment in his lectures. He has been invited to deliver many prestigious national and international orations over the years. He was awarded the Dandy medal in 2018 for his neurosurgical endeavors.

Excerpts from his students

All observers and fellows who come to learn from Dr Goel get influenced by him in various ways, and we maintain a book where they can pen down their experience while they are with him. The following are images of a few lines that his fellows have written to him.


01 March 2018

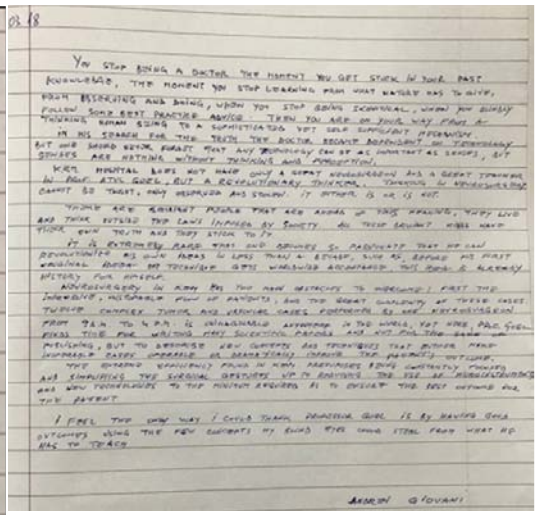
Dear Sir,

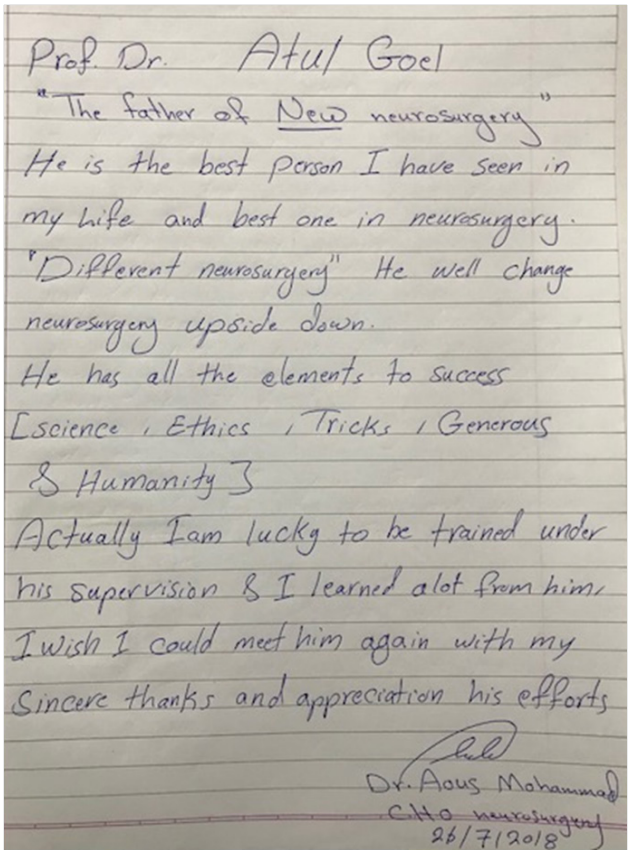
Thank you very much for your kindness and generosity. You have been very welcome to us and you give all your time to teach us wherever you have. Sir is also a humble person, considering what you have achieved in neurosurgery world. I wish you very best luck and hopefully you will invent many other techniques and show them to the world.

Yours sincerely

dr. Kharul. M

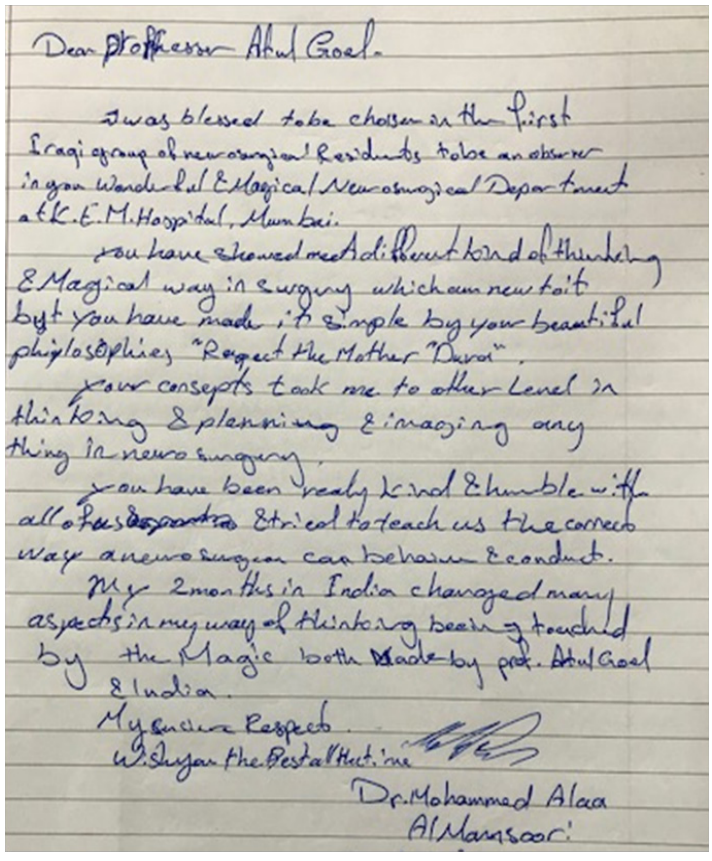
(INDONESIA)





Prof. Dr. Atul Goel
"The father of New neurosurgery"
He is the best person I have seen in my life and best one in neurosurgery.
"Different neurosurgery" He well change neurosurgery upside down.
He has all the elements to success
[science, Ethics, Tricks, Generous & Humanity]
Actually I am lucky to be trained under his supervision & I learned alot from him.
I wish I could meet him again with my sincere thanks and appreciation his efforts

Dr. Aous Mohammad
Citto neurosurgery
26/7/2018



Dear professor Atul Goel.

I was blessed to be chosen in the first Iraqi group of neurosurgical residents to be an observer in your Wonderful & Magical Neurosurgical Department at K.E.M. Hospital, Mumbai.

You have showed me A different kind of thinking & Magical way in surgery which am new to it but you have made it simple by your beautiful philosophies "Respect the Mother Dural".

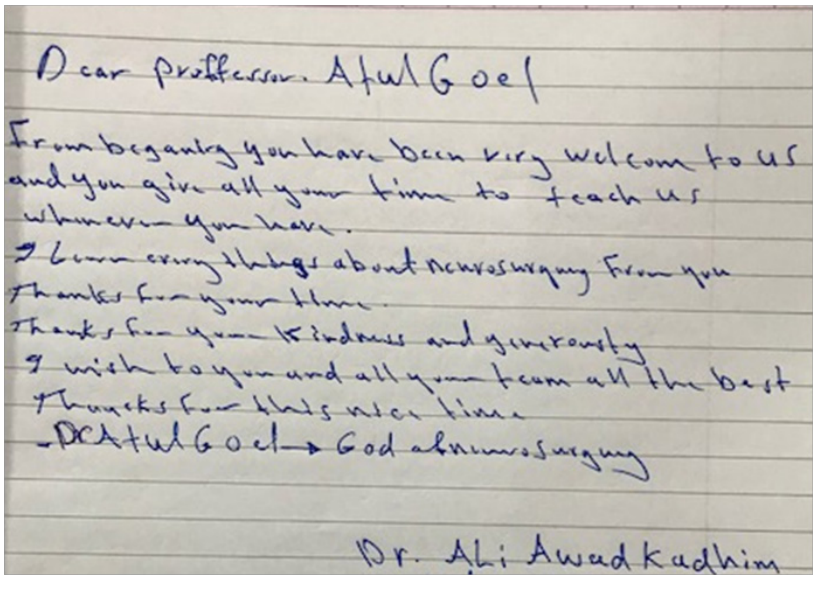
Your consepts took me to other Level in thinking & planning & imaging any thing in neurosurgery.

You have been really kind & humble with all of us & ethical to teach us the correct way a neurosurgeon can behave & conduct.

My 2 months in India changed many aspects in my way of thinking being touched by the Magic both made by prof. Atul Goel & India.

My sincere Respect.
Wish you the best all the time

Dr. Mohammed Alaa
Al Mansoor



Dear professor. Atul Goel

From beganing you have been very welcom to us and you give all your time to teach us whenever you have.
I learn every things about neurosurgery from you
Thanks for your time.
Thanks for your kindness and generosity
I wish to you and all your team all the best
Thanks for this nice time
-Dr Atul Goel → God of neurosurgery

Dr. Ali Awad Kadhim

The Husband and Father

Behind every successful man is an incredible woman

Dr Goel married his houseman in neurosurgery Dr Naina Goel who went on to become a neuropathologist. She practices at the K.E.M Hospital. She has been a constant support to his whims and ideas and his workaholic nature. He dotes on his daughter Aimee and is proud of her achievements.

Dr. Goel has become an iconic figure in neurosurgery and is widely appreciated and loved as a great teacher, mentor, and innovator.

From left to right: Dr. Atul Goel, his wife: Dr. Naina Goel and his daughter: Dr. Aimee Goel.

Students of Professor Atul Goel

Few Landmark Articles Published in Spinal Neurosurgery by Prof. Atul Goel (Selected from a list of over 600 published articles)

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