

MARUTHUVA VIVEKAM

Doctors Advice - For a Healthier Life

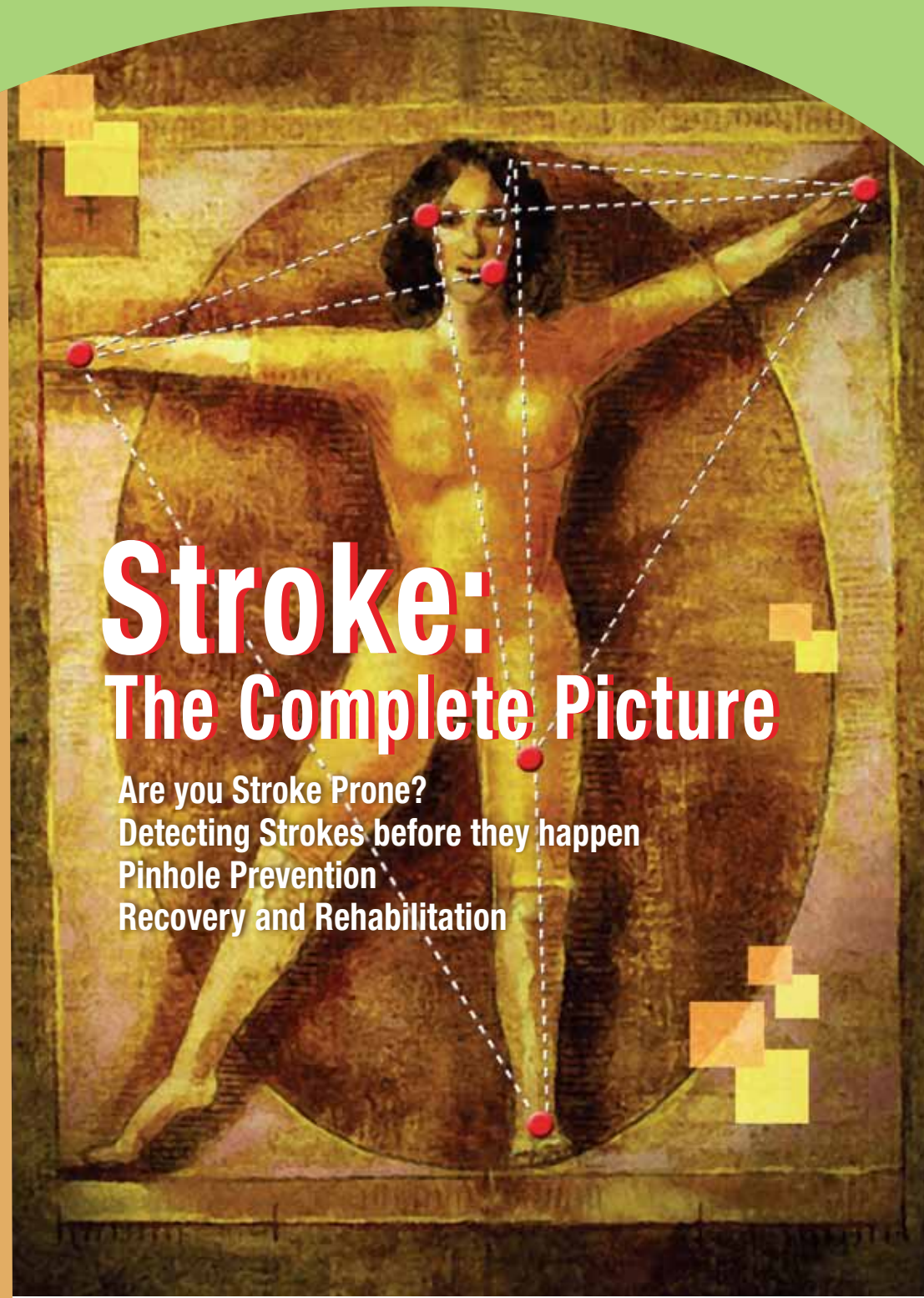


Warning:
*A Stroke is Waiting
to Strike!*

*Its silent. Its deadly. There
are barely any warnings.*

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Stroke: The Complete Picture

Are you Stroke Prone?
Detecting Strokes before they happen
Pinhole Prevention
Recovery and Rehabilitation

From the Chairman's Desk



Dear Friends,

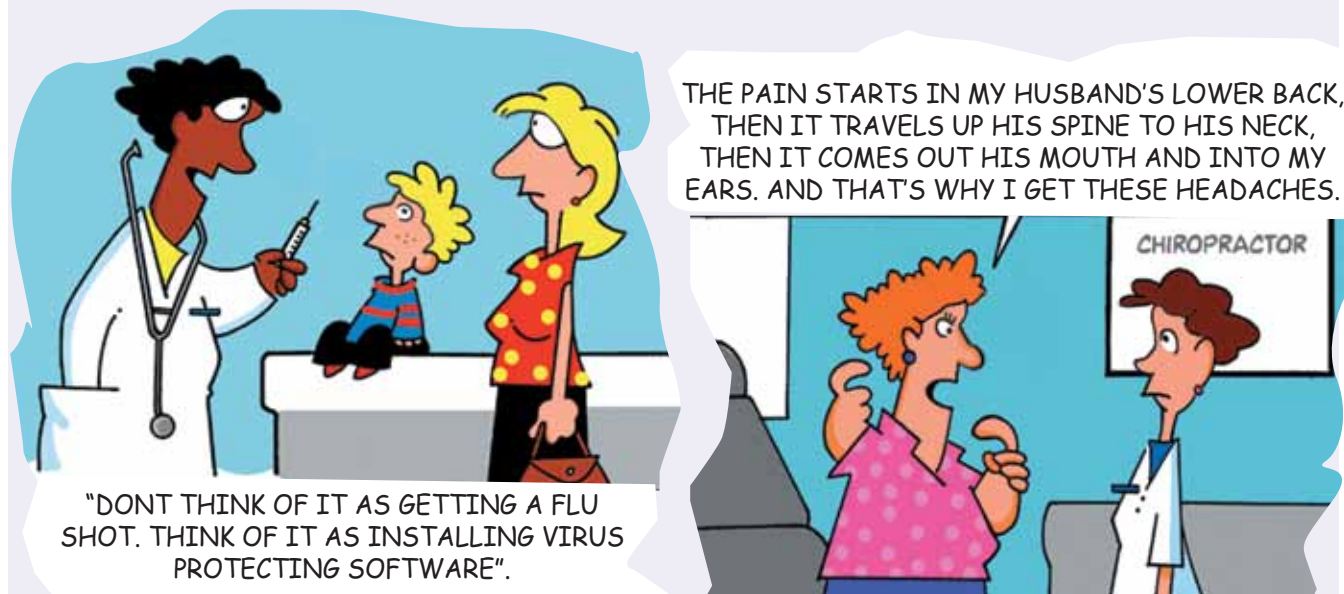
This edition we talk about a very important issue. Strokes. Strokes are life changing and very hard to detect. A head ache ... a loss of feeling in a limb...a fainting spell... very few people join the dots in time to avert this medical catastrophe which cannot be reversed. But if you are a high risk patient (or genetically prone to stroke) there are ways to screen to take preventive measures. It's time every one of us knew this - that's why this issue is dedicated to creating awareness on strokes, how to identify the symptoms and how to act quickly and effectively and provide the best treatment possible in the quickest time.

We hope you will find the information useful. As always we look forward to your feedback.

Good luck and good health,

Mrs. Mallika Mohandas
Chairman, MIOT Hospitals

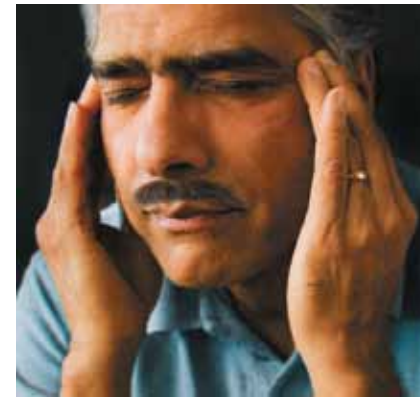
Laughter is the Best Medicine



Front Piece



Stroke – Living Death?



Several years ago a close friend of mine who was also one of the top industrialists in the state, called up from a meeting with the Chief Minister and complained that he had had some difficulty in speaking. "Nakku kolagearithu" was how he described it. Though he had recovered in a short while, I recognized it as a symptom of a stroke in evolution and asked him to rush to the hospital.

He arrived at Vijaya Hospitals where I was working at that time. I examined him and found that except for exaggerated reflexes in the upper and lower limbs there was no other problem elsewhere.

We admitted him, calling in the physician, neurologist, cardiologist and the critical care specialist. All investigations were done including CT Scan, MRI etc., and I could see that he was slowly getting paralysed in the right upper limb and lower limb and gradually losing his power of speech. The doctors were powerless to prevent the stroke.

A classic case

His is a classic case of a stroke victim. A man in the pinnacle of his

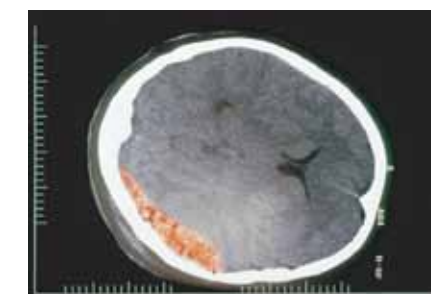
life, cut down in a matter of hours. Neither his wealth nor powerful connections could ever restore him to normalcy.

From that day onwards to the end of his life 15 years later, he had to be fed, bathed and clothed. The only way he could communicate was by scrawling on a piece of paper. As the years went by he became a non-entity losing his health, his business and his home. He died an insolvent after burdening his family for years. Thus, a man who could summon up ministers with a single phone call was, by the end of his life, an object of ridicule to his grandchildren.

A new resolution

It affected me personally that though my friend had reached me for help at the right place at the right time, I could do nothing to prevent the catastrophe. I vowed to do something about it ever since.

A stroke is caused either by hemorrhage (bleeding) in the brain or an infarct (a block which deprives areas of the brain of blood). By overcoming the block or controlling the hemorrhage through stenting the blood vessels in time,



CAT Scan of the brain

we can prevent the full-blown effect of the stroke from setting in. At that time we did not have the technology to do this.



Stent for opening brain blood vessels

Stroke Detection at MIOT

My friend's case stimulated me into following closely the new developments in this field. I procured the most sophisticated imaging technology which will help us identify the blood vessels that are blocked in the brain and invested in the right specialists, so that people at high risk, like my friend, can now be saved from living death.

Prof. Dr. P.V.A. Mohandas

Warning: A Stroke is Waiting to Strike!

Its silent. Its deadly. There are barely any warnings. Once a stroke sets in the effects are practically irreversible. The key is deciphering the symptoms in time.



Mr Narayana 60 was just returning from his morning walk. He was a diabetic patient for some years and the doctor had prescribed diet and exercise. As he walked back from the neighbourhood park his mind was filled with the horoscopes he had received for his 24-year old daughter. Suddenly he blacked out. When he opened his eyes he found himself lying on the stone pathway surrounded by concerned people. Shaken, he got to his feet, and someone accompanied him home.

Later while drinking a strong cup of coffee with his wife he wondered aloud if it was time to make another visit to the doctor. "You had the trembling in your hand last week," she reminded him, "and that terrible headache last month". But that didn't return," he said. "Let's wait and see – maybe once an alliance is fixed I will go for a check up". They say "Man proposes, God disposes." Within two weeks of this

conversation, Mr. Narayana woke up with a numbness in his hand which spread to the whole left side of his body. He tried to rouse his wife, but couldn't get his mouth to move. In fact a whole side of his body didn't respond. Finally sensing his distress his wife awoke and rushed him to the hospital. Mr. Narayan would never take a morning walk again. "How did it happen to us suddenly?" his wife asked herself over and over again. "How could we have prevented it?" To find the answers we must look at what causes a stroke.

How do strokes occur?

A stroke occurs when the blood supply to a part of the brain is interrupted or severely reduced. Deprived of adequate oxygen and nutrients, the brain cells begin to die. In the United States, stroke is a leading cause of adult disability and the third leading cause of death; only heart disease and cancer cause more deaths annually.

What are the signs and symptoms?

The signs and symptoms of stroke usually occur suddenly:

- Sudden numbness, weakness, or paralysis of face, arm or leg — usually on one side of body
- Sudden difficulty speaking or understanding speech
- Sudden blurred, double or

- decreased vision
- Sudden dizziness, loss of balance or loss of coordination
- A sudden, severe "bolt out of the blue" headache or an unusual headache with a stiff neck, facial pain, pain between eyes, vomiting or altered consciousness
- Confusion or problems with memory, spatial orientation or perception



Are there any warning signs?

Stroke gives no warning.

However there is one warning sign called as **Transient Ischemic Attack** (TIA) which is due to temporary interruption of blood supply.

The signs and symptoms of TIA are similar to stroke but they last for a few seconds/minutes but less than 24 hours and patients fully recover.

A TIA indicates a serious underlying risk that a full-blown stroke may follow. People who have had a TIA are much more likely to have a stroke than those who haven't had a TIA.

What are the risk factors for stroke?



- **Family history**
- **Age:** Risk increases with age

- **Sex:** Stroke affects men and women about equally
- **High blood pressure** (hypertension). High blood pressure is a risk factor for both ischemic and hemorrhagic strokes. It can weaken and damage blood vessels in and around your brain, leaving them vulnerable to atherosclerosis and hemorrhage
- High blood cholesterol
- Smoking
- Diabetes
- Obesity
- Cardiovascular disease
- Previous stroke or TIA
- Use of birth control pills and hormone therapy
- Heavy or binge drinking



- Illicit drugs such as cocaine
- Uncontrolled stress

If Mr. Narayana had recognized the symptoms and visited the doctor earlier could his stroke have been prevented?

Life After a Stroke – Recovery and Rehabilitation

A stroke affects not only the patient but the entire family unit.

In addition to obvious changes like difficulty in speaking, walking, paralysis there are also subtle changes like extreme fatigue (since every movement is tiring for them), depression, temper tantrums and so on. It takes a great deal of patience, understanding and love to deal with a stroke victim.

Recovery and rehabilitation.

Recovery and rehabilitation depend on the area of the brain involved and the amount of tissue damage. Harm to the right side of the brain may impair movement and

sensation on the left side of the body. Damage to brain tissue on the left side may affect movement on the right side; this damage may also cause speech and language disorders. In addition, people who've had a stroke may have problems with breathing, swallowing, balancing and hearing, loss of vision and bladder or bowel function.

Because numerous impairments may be involved, rehabilitation is facilitated by a diverse team, which may include a:

- Rehabilitation doctor
- Nurse

- Dietician
- Physical therapist

Coming home

At first it feels wonderful that a stroke survivor has recovered enough to go home. But there are several questions to be answered and lifestyle issues to be addressed. If the stroke survivor lives alone an aide or live in help must be organized. If they are moving into a family, living arrangements will have to be altered to accommodate the patient.



Different Strokes for Different Folks

All strokes are not the same. Different types of strokes call for different treatment.



A stroke can affect a person in many ways. Some put a person into a coma. Some are partial, affecting only one side of the body, or an arm or a leg.

Clinically these strokes arise from two conditions - reduced blood supply to the brain, called ischemic stroke, or bleeding in the brain substance or in the coverings of the brain called hemorrhagic stroke.

Understanding Ischemic strokes

Ischemic strokes occur when blood supply to the brain is blocked by blood clots or other particles.

The most common ischemic strokes are:

- **Thrombotic stroke:** This type of stroke occurs when a blood clot forms in one of the arteries that supply blood to the brain.

This process can occur within one of the two carotid arteries of the neck that carry blood to the brain, as well as in other arteries. An ischemic stroke may also be caused by plaques that completely clog or narrow an artery. This narrowing is called stenosis

- **Embolic stroke:** A clot or other particle from heart or neck vessel lodges in brain blood vessel and causes a stroke

Understanding Hemorrhagic strokes

"Hemorrhage" is the medical word for bleeding. Hemorrhagic stroke occurs when a blood vessel in the brain leaks or ruptures.

Hemorrhages can result from a number of conditions
Uncontrolled high blood pressure (hypertension)

Brain Aneurysms (Bulge in brain blood vessel)

Rupture of an arteriovenous malformation (AVM) — a malformed tangle of thin-walled blood vessels

There are two types of hemorrhagic strokes:

- **Intracerebral hemorrhage:**

High blood pressure can cause small arteries inside the brain to rupture. Blood spills into the surrounding brain tissue, damaging cells. Brain cells beyond the leak are deprived of blood and are also damaged.

- **Subarachnoid hemorrhage:**

In this type of stroke, blood from a ruptured blood vessel spills into the coverings of the brain. Patients have a sudden, severe "thunderclap" headache. After subarachnoid hemorrhage, vessels may go into vasospasm, a condition in which arteries near the hemorrhage constrict erratically, causing brain cell damage by blocking blood flow to portions of the brain.

When to seek medical advice

If you notice any signs or symptoms of a stroke or TIA, get medical help right away. A TIA may seem like a passing event. But it is an important warning sign - and a chance to take steps that may prevent a stroke.

If someone appears to be having a stroke, watch the person carefully while waiting for an ambulance.

You may need to take additional actions in the following situations:

- If breathing ceases, begin resuscitation.
- If vomiting occurs, turn the person's head to the side. This can prevent choking.
- Don't let the person eat or drink anything.

Every minute counts when it comes to treating a stroke or TIA. The longer a stroke goes untreated, the greater the damage and potential for disability. The success of most treatments depends on how soon a person is seen by a doctor in a hospital emergency room after signs and symptoms begin.

Prevention is Cure: Detecting and diagnosing patients with stroke risk

Before treating patients with risk factors, a previous stroke or TIA, patients need a complete evaluation.



Mr. Sen, a 63 year old man from Calcutta had a stroke years ago from which he had recovered. Suddenly years later, he began to suffer from giddiness for which he was put on medication for blood pressure. He also noticed that he was beginning to develop transient weakness in his hand and legs. He decided to come to MIOT for investigation.

At MIOT we did a CT Angio on the patient. It revealed a block in the carotid artery supplying blood to the brain. It was an 80% narrowing. Mr. Sen was on the verge of a massive stroke. Thanks to this early detection Mr. Sen underwent a procedure for carotid stenting and 4 days later he was discharged and a future stroke was averted.

The best cure for stroke is prevention. Stroke detection involves:

Physical examination and tests and risk factor screening for:

- High blood pressure
- High cholesterol levels
- Diabetes
- Elevated levels of the amino acid homocysteine.

Carotid ultrasonography

Is used to screen for any significant narrowing of neck vessels.

Computerized tomography (CT)

CT angiography of neck and brain vessels is a very good diagnostic test to identify narrowing of neck or brain blood vessels. If there is a significant narrowing patients need further treatment like carotid stenting.

Magnetic resonance imaging (MRI)



This test is sensitive for detecting an area of brain tissue damaged by an ischemic stroke. Magnetic resonance angiography (MRA) uses this magnetic field and a dye injected into your veins to evaluate arteries in the neck and brain.

Echocardiography

Is done to exclude cardiac abnormalities, to assess cardiac function and to rule out any large

clots in the heart chambers.

In India alone close to 1800 people lose their lives everyday from stroke.

Whatever the cause, modern day medicine holds the answers to the brain stroke problem. Seek early neurological consultations for the best results as the time window to achieve dramatic cures is very short – less than 3 hours in most cases!

How can one prevent strokes?

Knowing the risk factors and a healthy lifestyle are the best steps you can take to prevent a stroke.

- Control high blood pressure (hypertension)
- Lower cholesterol
- Don't smoke
- Control diabetes
- Maintain a healthy weight
- Exercise regularly
- Manage stress
- Binge drinking and heavy alcohol consumption increase your risk of high blood pressure and of ischemic and hemorrhagic strokes
- Don't use illicit drugs. Many street drugs, such as cocaine and crack cocaine, are established risk factors for a TIA or a stroke

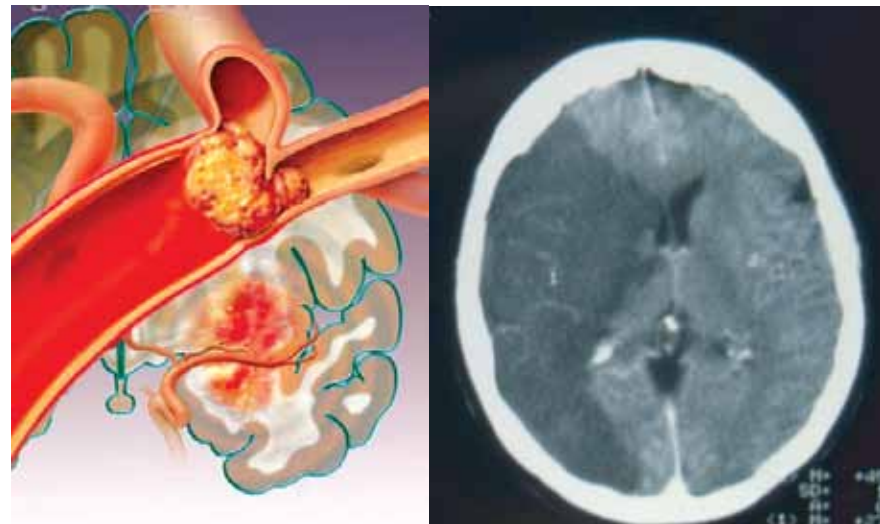
The best advice we can give for those who are in the high risk category for stress is to follow a healthy diet and to screen for risk factors.





Treating a Stroke

Strokes are treated differently depending on the underlying reasons. Treatment depends on the type of stroke.



Clot in a brain blood vessel causing stroke

TIME SAVES BRAIN

In the case of Ischemic strokes, that is strokes caused due to blocked blood vessels, the blocks need to be removed as early as possible.

Emergency treatment.

Therapy with clot-busting drugs must start within three hours. Quick treatment not only improves chances of survival, but may also reduce the amount of disability resulting from the stroke.

TPA (Tissue Plasminogen Activator) is a very potent drug which can be given intravenously within 3 hours.

The Interventional Radiologist can give the same drug directly into the blocked artery by taking a small catheter from the groin into brain. Alternatively he can also give Pro Urokinase directly into the blocked vessel within 6 hours.

Regular treatment

If a patient lands up after 6 hours he is put on regular anti platelet and anticoagulant medications

along with physiotherapy and rehabilitation.

Stroke Prevention Surgeries:

This includes surgical and other procedures to open up an artery that's moderate to severely narrowed by plaques:

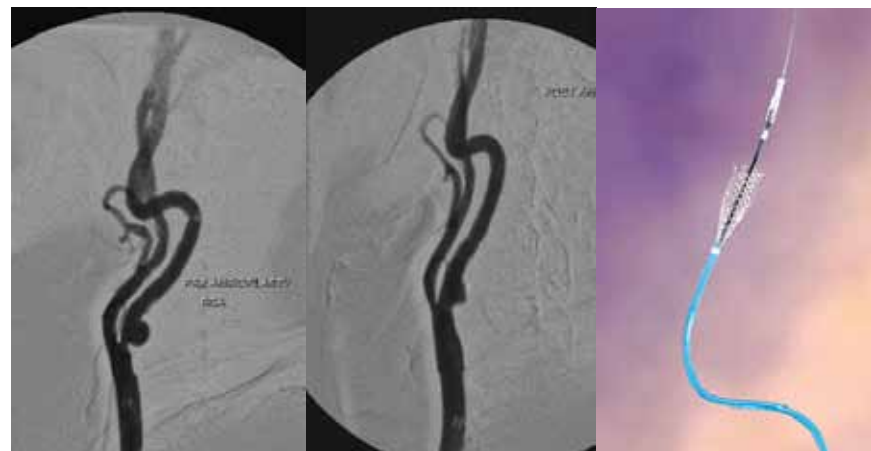
- **Carotid Angioplasty and Stenting:** In this procedure, a balloon-tipped catheter is maneuvered into the obstructed area of the artery. The balloon is inflated, compressing the plaques against the artery walls. A metallic

mesh tube (stent) is usually left in the artery to prevent recurrent narrowing. Distal protection devices also may be used with angioplasty.

- **Carotid Endarterectomy:** A surgical procedure where the surgeon opens up the blocked blood vessel through open surgery.

What are the preventive medications for stroke?

- **Preventive medications:** It's important to determine why the stroke occurred and to prevent another. There are recommended medications to help reduce the risk of having a TIA or stroke. These include:
 - **Anti-platelet drugs:** Platelets are cells in blood that initiate clots. Anti-platelet drugs make the platelets less sticky and less likely to clot. The most frequently used anti-platelet medication is aspirin.
 - The other anti-platelet drugs include clopidogrel (Plavix) or ticlopidine (Ticlid).
 - **Anticoagulants:** These drugs



Narrowed neck blood vessel opened by stent insertion by pinhole technique

Article

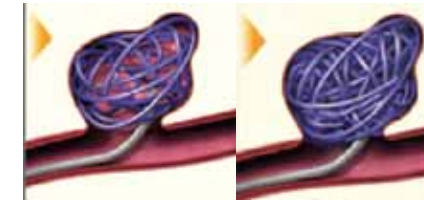
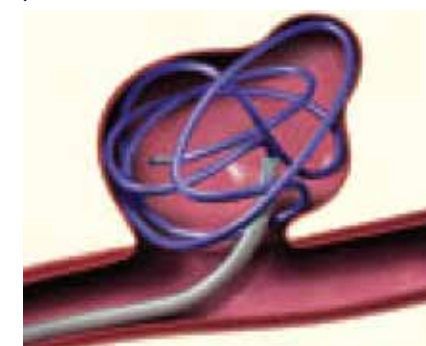
include heparin and warfarin (Coumadin). They affect the clotting mechanism in a different manner than do anti-platelet medications. Heparin is fast acting and is used over the short term in the hospital. Slower acting warfarin is used over a longer term. These drugs have a profound effect on blood clotting and require that you work with your doctor to monitor them closely.

How to treat Brain Hemorrhages?

- **Hypertensive bleeds:** Are usually treated conservatively. In case the bleed is very large patient need surgical intervention.
- **Subarachnoid bleeds** due to aneurysm

Aneurysms are bulges in brain blood vessels which rupture and spill into the coverings of the brain to cause a subarachnoid bleed. Patients have a sudden, severe "thunderclap" headache. After subarachnoid hemorrhage, vessels may go into vasospasm, a condition in which arteries near the hemorrhage constrict erratically, causing brain cell damage by further restricting or blocking blood flow to portions of the brain.

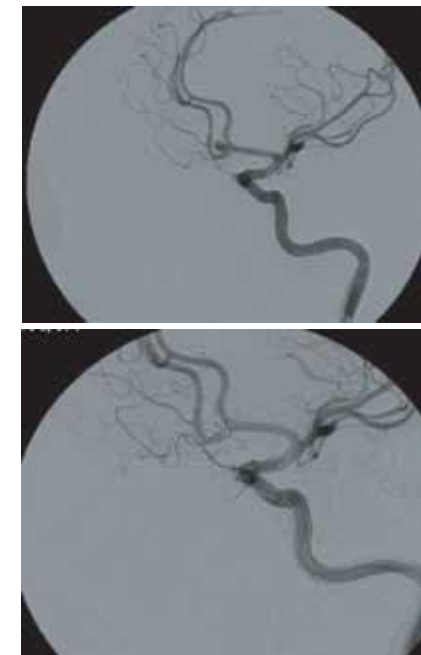
Aneurysms need early intervention to prevent rebleeding. The procedures which are done include



Aneurysm occluded by coils

aneurysm clipping. A tiny clamp is placed at the base of the aneurysm, isolating it from the circulation of the artery to which it's attached. This can keep the aneurysm from bursting, or it can prevent re-bleeding of an aneurysm that has recently hemorrhaged.

- **Pinhole Option,...**Coiling (aneurysm embolization).



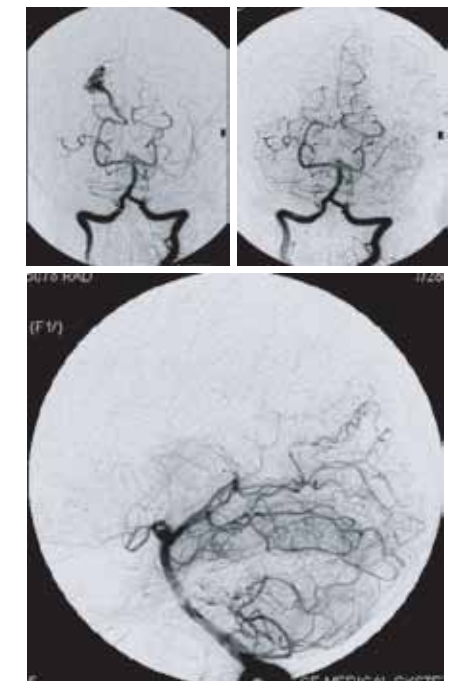
Brain aneurysm treated by coiling

- In an embolization procedure, a catheter is maneuvered from the groin into the aneurysm. A tiny platinum coil is pushed through the catheter and positioned inside the aneurysm. The coil fills the aneurysm and seals the aneurysm off from connecting arteries. In this procedure there is no need for opening the skull. The procedure is

safer as well.

How is brain AVM treated ?

- Surgical AVM removal.
- It's not always possible to remove an AVM if it's too large or if it's located deep within the brain. Surgical removal of a smaller AVM from a more accessible portion of the brain, though, can eliminate the risk of rupture, lowering the overall risk of hemorrhagic stroke.
- Other treatment options for AVMs include embolization, in which the small arteries supplying the blood to the AVM are blocked, shrinking the AVM.
- Radiosurgery or Gamma Knife therapy is another alternative option for treating small AVMs.



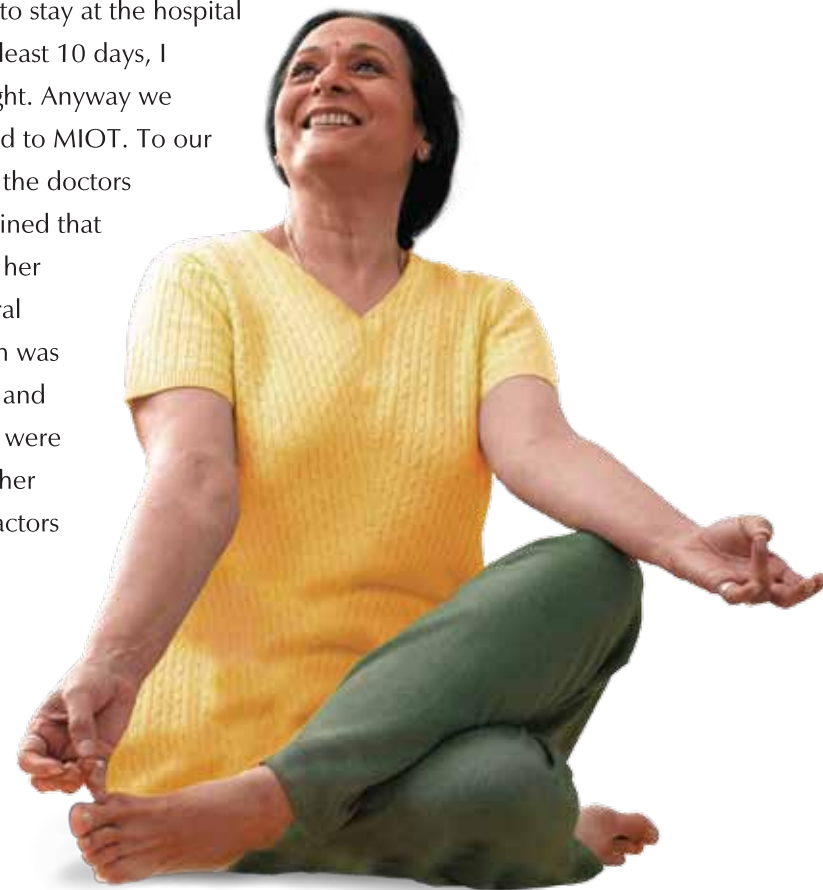
AVM Brain treated by pinhole surgery

A Pinhole Saved My Mother From Being Paralysed For Life

It was a week before my daughter's wedding. We were preparing for the arrival of relatives from all over India. So when my mother started complaining of headache we didn't pay much attention. She applied some balm, took some painkillers and tried to find a quiet place to lie down. I noticed that she was very restless. Within an hour her headache became so severe that she began vomiting. It was not responding to any of the painkillers. "I have never had such a terrible headache in my life" she moaned, "please take me to a doctor".

Since she usually hates to visit the doctor we realized that she must indeed be in severe pain. So I dropped all the other arrangements and we went to a nearby clinic. Here the GP advised a scan. The results of the scan shocked me. They said that my mother had bleeding in the brain. Due to hypertension a blood vessel in the brain had started bulging (an aneurysm, they called it) and some blood had seeped out. The bleeding had stopped but could restart at any time and the consequences could lead to paralysis or even be fatal. An immediate surgery was advised. All of us were stunned at the thought of brain surgery. Of course mother's health was important but the wedding could not be postponed either. Surely we will

have to stay at the hospital for at least 10 days, I thought. Anyway we rushed to MIOT. To our relief the doctors explained that since her general health was good and there were no other risk factors the



procedure could be done through the Pinhole method.

The doctor explained that in this method a catheter would be introduced which would be guided through the arteries, using the latest imaging devices, to the affected area in the brain. Through it a coil was placed in the aneurysm which would stop the bulging and the bleeding.

We scheduled the surgery as early as possible. My mother was given anesthesia and she underwent the two-hour procedure. 3 days later we did a repeat scan which showed that

the aneurysm was under control and she was discharged.

Now 3 months later my daughter and her husband are back from their honeymoon and her grandmother was right there at the door with the arathi to welcome them, perfectly fine.



A Pinhole in Time

Pinhole intervention in time can prevent a full-blown stroke from striking



Every stroke story has its own unique beginning. For some patients it begins with a violent headache, for some others it's a numbness in the hand, for some its a loss of speech or sudden paralysis. In fact no two strokes are exactly alike.

Evolution of a Stroke

Simply put a stroke is the result of a sudden blockage caused by a clot, bleeding or narrowing of an artery that shuts off blood supply to parts of the brain. When the brain is deprived of oxygen supply even for as few as four minutes, brain cells begin to die. As you know different parts of the brain control different functions such as memory, creative thinking, speech, motor skills and so on. Depending on which part of the brain is damaged the activities controlled by that part of the brain

get affected as well.

The Golden Hour

After an "episode" has occurred every minute counts. There is a narrow window of 3-6 hours during which intervention can prevent a full blown stroke from setting in.

Stroke Detection at MIOT

Once a patient is brought to the hospital, he is scanned to locate the affected blood vessels.

Traditionally, narrowed blood vessels in the neck are treated through open surgery. Now the same block can be treated through pinhole surgeries. Blocked blood vessels anywhere in the neck or brain can be accessed with a catheter followed by dilatation with a balloon and stent placement.

The Role of Pinhole Surgery

Navigating the balloons and stents through the arteries, from the groin requires a sophisticated digital cathlab with facilities for 3D angiography, subtraction angiography and road mapping. The availability of better quality stents, good guide wires and sophisticated equipments with a well-trained team have made these procedures more popular with fewer



Balloon used for opening blood vessels

complications.

Once the cause of the stroke is identified, the treatment modality is decided.

If there is a block it can be treated by administration of thrombolytic (anti-clotting) agents either intravenously or intra arterially to dissolve the clots.

The stroke could be caused by an aneurysm (a bulge in brain blood vessels that may rupture and cause bleeding with devastating effects). These aneurysms need to be treated before they rupture. A catheter can be taken from the groin and coils deposited into the aneurysm to prevent bleeding.

Similarly blocks in the arteries of brain can be tackled by taking a catheter directly into thrombi and using thrombolytic agents.

Quick Recovery

There is no need for opening up of the skull to do these procedures.

As the procedures are performed through a tiny puncture, there is practically no bleeding, less pain and no scar.

Patients recover faster and can resume normal activities quicker after pinhole surgery.

With pinhole intervention within the golden hour, complete neurological function can be restored.

Don't let a stroke paralyse your strokes



Yes. You can pull back from a stroke and be practising your ground strokes on a tennis court a few days later. The solution? A new simple, safe procedure - Pinhole Surgery.

How Pinhole Surgery works

Stroke, the No. 3 killer in the world, is caused by blood clots in the arteries supplying the brain. Using their expertise in imaging, Pinhole Surgeons guide a catheter as thin as a hair, through the arteries to the affected area and administer a clot busting drug. If administered early enough this restores blood flow and reverses the effects of the stroke.

Pinhole procedures improve outcome, shorten recovery, reduce complications, pain and scars. In many cases pinhole procedures have replaced open surgery.

MIOT makes it simple

Of course what seems a simple procedure to you is far from simple to us. At MIOT we have made extensive investments in imaging equipment, miniaturized devices and in specialised training to offer you pinhole surgery.

Think small. Think safe. Think Pinhole Surgery at MIOT.

Announcing
MIOTPinhole 
SURGERY

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