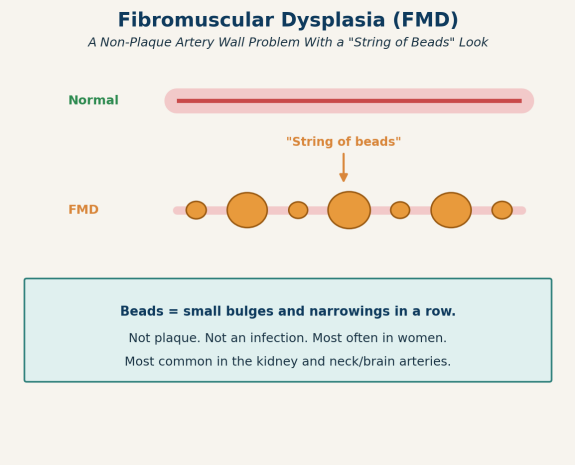
Fibromuscular Dysplasia (FMD)

A Non-Plaque Artery Wall Problem With a "String of Beads" Look

Fibromuscular dysplasia (FMD) is a problem in the wall of medium arteries — not plaque and not an infection. It can raise blood pressure and cause headaches or a whooshing in the ear. This guide explains what it is and how it is treated.



Online: https://go.riasalimd.com/fmd-guide

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Names & Terms You Will Hear

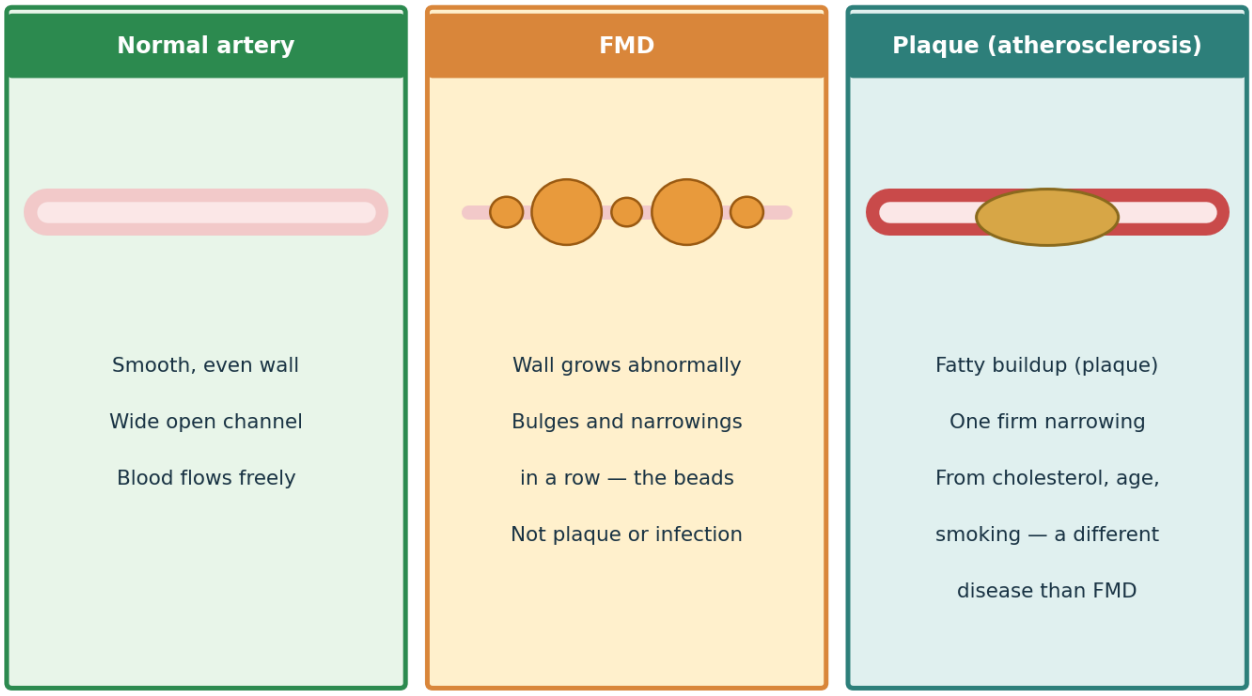
Term	Meaning
Fibromuscular Dysplasia (FMD)	A condition where the wall of a medium artery grows abnormally. It is not plaque and not an infection. It can narrow the artery and is most common in women.
String of Beads	The classic look of FMD on imaging — areas of narrowing alternating with small bulges, like beads on a string. It points to FMD rather than plaque.
Multifocal FMD	The most common type. It gives the beaded 'string of beads' pattern. It usually does not need surgery and often responds well to a balloon.
Focal FMD	A less common type with a single, tighter narrowing instead of beads. It can look more like a band across the artery.
Renal Artery FMD	FMD in a kidney artery — the most common site. It can raise blood pressure and is a treatable cause of high BP. See our Renal Artery Stenosis guide.
Carotid / Vertebral FMD	FMD in the neck arteries that feed the brain. It can cause headaches, a whooshing in the ear (pulsatile tinnitus), dizziness, or neck pain. Rarely it leads to a tear or stroke.
Pulsatile Tinnitus	A rhythmic whooshing sound in the ear that beats with the pulse. It is a common symptom when FMD affects the neck arteries.
Arterial Dissection	A tear in the inner lining of an artery wall. FMD makes arteries more prone to tears, including in the heart (SCAD) and the neck.
Aneurysm	A weak, bulging spot in an artery wall. FMD can be linked with aneurysms, which is one reason a full vascular scan is advised.

The big idea:
FMD makes the artery wall grow unevenly — bulges and narrowings in a row, the 'string of beads.' It is **not plaque and not an infection**, it mostly affects **women**, and it most often involves the **kidney** and **neck/brain** arteries.

Fibromuscular Dysplasia (FMD)?

- **What it is.** Fibromuscular dysplasia (FMD) is a condition where the wall of a medium-sized artery does not form normally. Parts of the wall thicken and others thin out — so the artery gets a beaded shape.
- **What it is NOT.** FMD is not caused by plaque or high cholesterol, and it is not an infection. It is a non-inflammatory, non-atherosclerotic problem in the artery wall itself.
- **The 'string of beads.'** The classic FMD look is areas of narrowing alternating with small bulges — like beads on a string. Doctors see this on imaging and it strongly points to FMD.
- **Who gets it.** FMD mostly affects women — about 9 in 10 people in the US FMD Registry were women, with an average age around 52. It can occur at any age, including in men and children.
- **Where it strikes.** The kidney (renal) arteries are the most common site, followed by the neck and brain (carotid and vertebral) arteries. It can also affect arteries in the belly and elsewhere.
- **How it is found.** A duplex ultrasound is often first. A CT angiogram (CTA) or MR angiogram (MRA) shows the beading clearly. A catheter angiogram gives the most detail when needed.

Three Ways an Artery Can Look



Three ways an artery can look. A normal artery is smooth with a wide, open channel. FMD makes the wall grow unevenly — bulges and narrowings in a row, the 'string of beads' — and is not plaque or infection. Plaque (atherosclerosis) is a fatty buildup from cholesterol, age, and smoking — a different disease. Source: 2019 AHA FMD Scientific Statement.

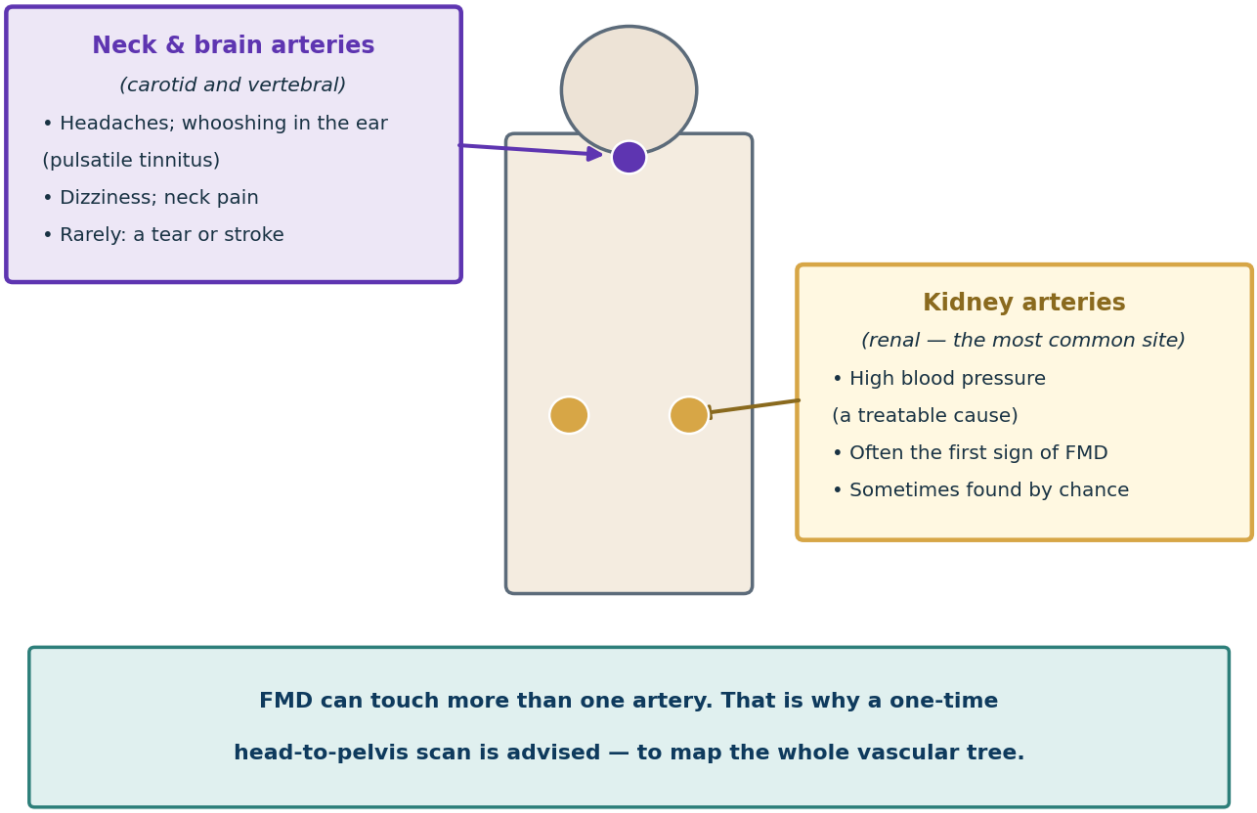
FMD versus atherosclerosis (plaque): how the two differ

Feature	FMD	Atherosclerosis (plaque)
Cause	Wall grows abnormally; not plaque, not infection	Fatty plaque from cholesterol, age, smoking
Classic look	'String of beads' (bulges and narrowings)	One firm narrowing, often at the artery opening
Who	Mostly women, often 40s-60s (any age)	Older adults, men and women
Common sites	Kidney, then neck/brain arteries	Heart, neck, leg, and kidney arteries
Treatment	BP control, aspirin, balloon (rarely a stent)	Statin, antiplatelet, sometimes stent/surgery

Why It Matters

- **It is a treatable cause of high blood pressure.** When FMD narrows a kidney artery, blood pressure can rise. Finding and treating it can improve or even cure the high BP — see our Renal Artery Stenosis guide.
- **Neck-artery symptoms have an explanation.** Headaches, a whooshing in the ear (pulsatile tinnitus), dizziness, or neck pain can come from FMD in the carotid or vertebral arteries — not just stress or migraines.
- **FMD raises the risk of artery tears.** The abnormal wall is more prone to a dissection (a tear in the lining). This includes tears in the neck arteries and in the heart arteries (SCAD).
- **It is linked with SCAD.** Many people who have a spontaneous coronary artery dissection (SCAD) also have FMD somewhere. See our SCAD guide.
- **It can come with aneurysms.** FMD can be linked with weak, bulging spots (aneurysms) in arteries. Mapping them early lets your team watch or treat them before they cause trouble.
- **Most people do well.** With the right diagnosis, blood-pressure control, and a plan to watch the arteries, most people with FMD live full, active lives.

Where FMD Strikes — and What It Can Cause



Where FMD strikes and what it can cause. The kidney (renal) arteries are the most common site and can raise blood pressure. The neck and brain (carotid and vertebral) arteries can cause headaches, a whooshing in the ear, dizziness, or neck pain. Because FMD can touch more than one artery, a one-time head-to-pelvis scan is advised. Source: US Registry for FMD; 2019 AHA Scientific Statement.

Why one scan checks everything:
More than half of people with FMD have it in two or more arteries, and FMD is linked with SCAD and aneurysms. So a **one-time head-to-pelvis CT or MR angiogram** is advised — to map the whole vascular tree and catch hidden problems early.

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Risk Factors

Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

Risk Factor	Why It Increases Risk
Being a woman	FMD is far more common in women — about 9 in 10 people in the US FMD Registry were female. It can still occur in men and children.
Middle adult age	Most people are diagnosed in their 40s to 60s (average around 52), but FMD can be found at any age, including the very young.
New or hard-to-control high BP in a younger person	High blood pressure that starts young or is hard to control can be a clue to FMD in a kidney artery.
A family member with FMD	FMD sometimes runs in families. A relative with FMD, an artery tear, or an aneurysm may raise your own chance.
A prior artery tear (dissection) or SCAD	If you have had a dissection — including a heart-artery tear (SCAD) — FMD may be the reason, and other arteries should be checked.
An aneurysm found elsewhere	A bulging artery (aneurysm) can travel with FMD. Finding one is a reason to map the rest of the vascular tree.

Treatment Options

- **Control blood pressure.** This is the foundation when FMD affects a kidney artery. An ACE inhibitor or ARB is often used — these target the exact hormone chain that drives the high BP. Kidney labs are watched after starting.
- **An antiplatelet, often low-dose aspirin.** Many people with FMD are placed on a daily low-dose aspirin to lower the chance of a clot or stroke, unless there is a reason not to. Your doctor decides if it is right for you.
- **Balloon angioplasty for the right cases.** When FMD in a kidney artery causes high blood pressure, widening the artery with a balloon often works very well — and a stent is usually NOT needed.
- **Map the whole vascular tree once.** A one-time head-to-pelvis CT or MR angiogram is advised after an FMD diagnosis. It checks for FMD, aneurysms, or tears in other arteries you may not feel.
- **Manage any aneurysm or dissection.** If a bulge or a tear is found, your team makes a plan — watchful imaging for small problems, or a procedure for larger or higher-risk ones.
- **Protect the neck arteries.** If FMD affects the carotid or vertebral arteries, your doctor may advise against forceful neck manipulation (such as high-velocity chiropractic adjustment) to lower the chance of a tear.
- **Stop smoking.** Smoking is hard on every artery wall and can worsen FMD-related problems. Quitting is one of the best steps you can take.
- **Long-term follow-up.** FMD is usually a lifelong condition to monitor, not a one-time fix. Blood pressure, symptoms, and imaging are followed over time.

The "String of Beads": What FMD Is (and Is Not)

- FMD is a problem in how the artery wall is built. Some parts of the wall thicken while others thin out. This uneven growth gives the artery its beaded shape.
- On imaging, this looks like areas of narrowing alternating with small bulges — the classic 'string of beads.' Seeing this pattern strongly points to FMD rather than plaque.
- **It is NOT plaque.** FMD is not caused by cholesterol buildup. That is why a statin treats plaque, not FMD itself (though a statin may still be used if you also have plaque).
- **It is NOT an infection or inflammation.** Antibiotics and anti-inflammatory drugs do not treat FMD. The wall simply does not form normally.
- There are two main types. Multifocal FMD gives the beaded look and is the most common. Focal FMD is a single, tighter narrowing and is less common.
- Because the wall is fragile, FMD arteries are more prone to a tear (dissection) and can come with weak, bulging spots (aneurysms).

Where It Strikes and the Symptoms It Causes

- **Kidney (renal) arteries — the most common site.** FMD here can raise blood pressure. This is a treatable cause of high BP, and it is often the first sign of FMD. See our Renal Artery Stenosis guide.
- **Neck and brain (carotid and vertebral) arteries.** FMD here can cause headaches, a whooshing in the ear that beats with the pulse (pulsatile tinnitus), dizziness, or neck pain.
- **Rare but serious neck-artery events.** Because the wall is fragile, a tear (dissection) or a stroke / TIA can occur. New, sudden neck pain or stroke-like symptoms need emergency care.
- **Symptoms depend on the artery.** The same disease feels very different depending on whether it affects the kidney, the neck, or another area — and some people have no symptoms at all.
- **It can affect more than one artery.** More than half of people in the US Registry had FMD in two or more areas. This is the reason for a one-time, head-to-pelvis scan.
- Sometimes FMD is found by chance on a scan done for another reason. Even then, mapping the rest of the arteries is worthwhile.

Living With FMD: The Whole Tree, SCAD, and Treatment

- **Map the whole vascular tree once.** After an FMD diagnosis, a one-time head-to-pelvis CT or MR angiogram is advised. It looks for FMD, aneurysms, or tears in arteries you cannot feel.
- **The SCAD link.** Many people who have a spontaneous coronary artery dissection (SCAD) also have FMD. If you have had SCAD, your arteries should be checked for FMD — see our SCAD guide.
- **Watch for aneurysms.** FMD can travel with aneurysms. Most are small and simply watched with imaging, but some need treatment — see our Aortic Aneurysm guide.
- **The medicine plan.** Blood-pressure control (often an ACE inhibitor or ARB) plus a daily low-dose aspirin in many people. Kidney labs are watched after starting a BP pill.
- **Balloon angioplasty when needed.** For renal FMD causing high BP, widening the artery with a balloon often works very well — and a stent is usually not needed.
- **Protect fragile arteries.** If neck arteries are involved, avoid forceful neck manipulation. Do not smoke. Keep follow-up visits — FMD is a condition to monitor for life.

Comfort Measures at Home (No Medication Needed)

These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Do not smoke, and avoid secondhand smoke. Smoking stresses the artery wall and can make FMD problems worse.
- Keep your blood pressure log. Bring home BP readings to your visits — they help your team see how well treatment is working.
- Stay active in a steady, moderate way. Walking, cycling, and swimming are great. Ask your doctor before very heavy lifting or straining.
- Be gentle with your neck if neck arteries are involved. Avoid forceful neck cracking or high-velocity adjustments unless your doctor approves.
- Take medicines as prescribed. Do not stop a blood-pressure pill or aspirin on your own — call us first.
- Tell new providers you have FMD. It changes how some symptoms (like a sudden severe headache) should be checked.
- Plan ahead for pregnancy. If you have FMD and are planning a pregnancy, let your team know so blood pressure and arteries can be watched closely.

Risks, Benefits, and Alternatives

Every choice has trade-offs. Use this table to start the shared decision conversation.

Option	Risks	Benefits	Alternatives
Duplex ultrasound / CTA / MRA	Ultrasound has no radiation or dye but depends on the operator. CTA and MRA use dye and show the beading clearly. Low burden overall.	Finds the 'string of beads,' grades the narrowing, and helps plan treatment. CTA/MRA also map other arteries.	Catheter angiography for the clearest detail when a procedure is planned or the picture is unclear.
Blood-pressure medicine (ACE/ARB)	Can cause a fast kidney-function drop, especially with narrowing on both sides, and may raise potassium. Kidney labs are checked after starting.	Targets the exact hormone chain that drives the high BP in renal FMD. Effective and protects the heart and kidneys.	Other BP drug classes (such as a calcium-channel blocker) if an ACE/ARB cannot be used safely.
Low-dose aspirin (antiplatelet)	A small risk of bleeding or stomach upset. Not right for everyone — your doctor weighs it for you.	Lowers the chance of a clot or stroke, which matters when neck or brain arteries are involved.	No antiplatelet if the bleeding risk is high, with closer symptom monitoring instead.
Balloon angioplasty (renal FMD)	A catheter procedure with a small risk of an artery tear or bleeding at the access site. Done at experienced centers. Not every FMD lesion needs it.	Often works very well for renal FMD — can greatly improve or even cure the high BP. A stent is usually not needed.	BP medicines alone if the narrowing is mild or angioplasty is not a good fit, with close follow-up either way.

Common Misconceptions

Myth	Reality
"FMD is caused by plaque or high cholesterol."	No. FMD is a problem in how the artery wall is built — it is not plaque and not driven by cholesterol. It is a different disease from atherosclerosis, even though both can narrow an artery.
"FMD is an infection or an inflammation."	No. FMD is non-inflammatory and non-infectious. The wall simply grows abnormally. This is why antibiotics and anti-inflammatory drugs do not treat it.
"FMD only affects the kidneys."	The kidney arteries are the most common site, but FMD often affects the neck and brain arteries too — and sometimes more than one area at once. That is why a one-time head-to-pelvis scan is advised.
"A stent is always needed to fix FMD."	Usually not. For renal FMD causing high BP, balloon angioplasty alone often works very well and a stent is frequently not used. Many people are managed with medicines and monitoring.
"FMD has nothing to do with heart-artery tears."	FMD is closely linked with SCAD — a spontaneous tear in a heart artery. Many people with SCAD also have FMD somewhere, which is why both are checked together.
"If I feel fine, I do not need any follow-up."	FMD is usually a lifelong condition to watch. Blood pressure, symptoms, and imaging are followed over time, even when you feel well, to catch any new problem early.

Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

Where / What	What Can Happen
Kidney arteries and blood pressure	FMD in a kidney artery can raise blood pressure and, if severe and untreated, slowly strain the kidney. It is a treatable cause of high BP.
Neck and brain arteries	FMD in the carotid or vertebral arteries can cause headaches, pulsatile tinnitus, dizziness, or neck pain. Rarely it leads to a tear (dissection) or a stroke / TIA.
Heart arteries (SCAD)	FMD raises the risk of a spontaneous coronary artery dissection — a tear in a heart artery that can cause a heart attack. See our SCAD guide.
Aneurysms	FMD can come with weak, bulging spots (aneurysms) in arteries. Most are small and watched, but some need treatment to prevent a rupture.
Artery tears elsewhere	Because the wall is fragile, dissections can occur in other arteries too — in the belly (mesenteric) or elsewhere. Mapping the arteries helps find these early.

Points to Know

If you remember nothing else, remember these key points.

- FMD is a non-plaque, non-infection problem in the wall of medium arteries. It gives the classic 'string of beads' look — narrowings alternating with small bulges.
- It mostly affects women — about 9 in 10 in the US FMD Registry — usually diagnosed in the 40s to 60s, but it can occur at any age and in men.
- The kidney arteries are the most common site (causing high BP), followed by the neck and brain arteries (headaches, pulsatile tinnitus, dizziness, neck pain; rarely a tear or stroke).
- FMD is linked with SCAD (a heart-artery tear) and with aneurysms. That is why a one-time head-to-pelvis CT or MR angiogram is advised to map the whole vascular tree.
- Treatment usually means blood-pressure control (often an ACE inhibitor or ARB), an antiplatelet like low-dose aspirin in many people, and balloon angioplasty for renal FMD causing high BP — a stent is rarely needed.
- If neck arteries are involved, avoid forceful neck manipulation (such as high-velocity chiropractic adjustment) to lower the chance of a tear.
- Diagnosis uses duplex ultrasound, CT or MR angiography (which show the beading), and catheter angiography when the most detail is needed.
- Most people with FMD do well with the right diagnosis, treatment, and long-term follow-up. It is a condition to manage, not usually a one-time fix.

When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- **Call 911** for sudden one-sided weakness or numbness, trouble speaking, sudden vision loss, or the 'worst headache of your life.' These can be signs of a stroke or an artery tear. Do not drive yourself.
- **Call 911** for sudden severe chest pain or pressure, especially with sweating or shortness of breath. In FMD this can be a heart-artery tear (SCAD).
- **Call our office (727-943-5200)** if your home blood pressure stays above 150/90 on your medicines, or suddenly gets much worse.
- **Call us** if you have a new or worsening whooshing in the ear (pulsatile tinnitus), new neck pain, ongoing headaches, or new dizziness — these can point to neck-artery FMD.
- **Call us** if you start an ACE inhibitor or ARB and feel very tired, make much less urine, or have new swelling — and ask that your kidney labs be checked.
- **See our companion guides:** Renal Artery Stenosis, SCAD, Carotid Artery Disease, Secondary Hypertension, and Aortic Aneurysm.

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Companion guides:
Renal Artery Stenosis · SCAD · Carotid Artery Disease · Secondary Hypertension · Aortic Aneurysm

Trusted Resources

The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- Cleveland Clinic — Fibromuscular Dysplasia (FMD) - Plain-language overview of FMD, the string-of-beads look, the arteries it affects, and the link with dissection and aneurysm.
- Mayo Clinic — Fibromuscular Dysplasia - Patient overview of FMD symptoms, affected arteries, diagnosis (CTA/MRA/angiography), and treatment options.
- American Heart Association — Fibromuscular Dysplasia - AHA patient page framing FMD as a non-atherosclerotic artery disease, its predominance in women, and the value of head-to-pelvis imaging.
- Fibromuscular Dysplasia Society of America (FMDSA) - Patient advocacy and support organization that funds research and sponsors the US FMD patient registry.
- Society for Vascular Surgery — Fibromuscular Disease - Patient overview of FMD: who it affects, the 'string of beads' look, and why balloon angioplasty is often effective.
- 2019 AHA Scientific Statement on FMD - The scientific statement behind one-time head-to-pelvis imaging, antiplatelet and BP management, and screening for dissection and aneurysm.
- United States Registry for Fibromuscular Dysplasia - The registry data behind the numbers in this guide: ~91% female, average age around 52, and renal then carotid arteries as the most common sites.

Sources Used to Build This Guide

Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- Cleveland Clinic — Fibromuscular Dysplasia (FMD) *[Patient Education]*
  Plain-language overview of abnormal cell growth in artery walls (string-of-beads), renal and carotid involvement, and dissection/aneurysm risk.
- Mayo Clinic — Fibromuscular Dysplasia *[Patient Education]*
  Patient-facing symptoms, affected arteries, diagnosis (CTA/MRA/angiography), and treatment options.
- American Heart Association — Fibromuscular Dysplasia *[Patient Education]*
  Frames FMD as a non-atherosclerotic arterial disease, predominance in women, and the importance of head-to-pelvis imaging.
- 2019 AHA Scientific Statement — Fibromuscular Dysplasia: State of the Science and Critical Unanswered Questions *[Guideline]*
  Authoritative basis for one-time head-to-pelvis cross-sectional imaging, antiplatelet/BP management, and screening for dissection and aneurysm.
- United States Registry for Fibromuscular Dysplasia (Circulation, 2012) *[Registry]*
  Source for the registry numbers cited in the guide: ~91% of patients female, mean age at diagnosis ~52, renal artery most common, then carotid and vertebral, and multivessel disease in more than half.
- 2014 First International Consensus on the Diagnosis and Management of FMD *[Guideline]*
  Consensus framing of multifocal (string-of-beads) versus focal FMD, the link with SCAD and aneurysm/dissection, and head-to-pelvis imaging.
- Fibromuscular Dysplasia Society of America (FMDSA) *[Patient Advocacy]*
  Patient advocacy and support organization; sponsors the US FMD patient registry and offers plain-language education and support resources.
- Society for Vascular Surgery — Fibromuscular Disease *[Patient Education]*
  Patient overview of FMD: who it affects, the 'string of beads' appearance, the renal and carotid predominance, and why balloon angioplasty is often effective.
- StatPearls — Fibromuscular Dysplasia (NCBI Bookshelf) *[Reference]*
  Clinician reference for the pathology behind the string-of-beads (alternating ridges of collagen with preserved internal elastic lamina), age/sex epidemiology, and management.

About This Guide

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Reviewer note: Reviewed Cleveland Clinic, Mayo Clinic, and the American Heart Association FMD pages. This guide adds: a three-way artery picture (normal vs FMD 'string of beads' vs plaque); a body map of where FMD strikes with the matching symptoms; an FMD-vs-atherosclerosis comparison table; and the 2019 AHA Scientific Statement / US Registry facts on the head-to-pelvis scan and the SCAD link — usually missing from standard patient pages.

Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.

Take This Guide With You

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