



sexy, slim calves

Kevin Tan talks to Korean plastic surgeon Dr. Park Hyun Cheol about one of Korea's hottest procedures – calf reduction surgery.

"My calves are fat!" lamented a dear friend as she tucked into a carnally sinful double chocolate cheesecake over coffee one day. Funnily enough, she's actually blessed with the sort of body most women would kill to own. "I do Pilates, I work out three times a week," she snorts, "but my calves are still fat!"

When she goes shopping, it's not a matter of what she can fit into, but how much damage her credit card can take since everything looks good on her. Well, everything that's ankle length that is. "I can't wear anything above my ankles or I look like a bow-legged sailor!" she wailed as she gestured at her calves.

Korean plastic surgeon Dr. Park Hyun Cheol has this to say: "In general, Asian women have shorter legs and thicker calves

than Caucasian women. Many Caucasians have long, straight and slim calves while many Asians unfortunately have short, bowed and muscled calves that are not very attractive. With thicker calves, women have an appearance of having shorter legs."

Irrespective of culture, large calves are considered aesthetically unappealing for females; making what would be a perfectly lovely woman appear rough or overly masculine. In most cases, they create an image that a woman is shorter than they really are and bow-legged, like they have just gotten off a very long horse ride.

"As a result of this, such women would be reluctant to adopt certain fashion styles such as short skirts or they may feel conspicuous wearing a swimsuit or a bikini," says Dr. Park.

The worst part of it all is that it's not fat that's making those calves look huge. It's mostly muscle. Pure, grade A, tough-as-nails muscle. The kind you wish you had on your arms, abs and butt. As any bodybuilder will tell you, the more you work a muscle, the bigger it gets unless you resolve to become a couch potato for life.

There is, however, a solution. In Korea, women (and quite a few men) are taking the problem by the horns and are opt-



Korean plastic surgeon Dr. Park Hyun Cheol says Asian women have shorter legs and thicker calves than Caucasian women.



Pictures courtesy of Dr. Park Hyun Cheol.

A 28-year-old hockey player with a partial gastrocnemius muscle resection. After three months, the patient had a reduction in calf circumference from 37cm to 32.5cm.

ing for a range of procedures broadly known as calf reduction surgery.

Calf reduction surgery is a broad catch-all title for a range of methods with the end goal of shrinking or partially removing sections of the calf muscles to sculpt it. All these procedures have various tradeoffs in terms of patient downtime, efficacy, cost, pain and risks. The first published mention of a procedure to sculpt the calves was in 1997, by Dr. Ing Gon Kim. Dr. Ing described the procedure as a "partial gastrocnemius muscle resection". In plain English that means selective surgical removal of the calf muscles.

THE OBJECTIVES

One category of techniques selectively removes or destroys the motor nerves controlling the calf muscles. Without the nerves sending signals to the muscles, the muscles will remain relaxed and eventually result in atrophy (general physiological process of reabsorptive breakdown of tissues). Another set of techniques gets straight to the point and just removes sections of the calf muscles.

To date, no other country has as much demand for calf reduction surgery as Korea does. According to Dr. Park, who has conducted over 400 calf reduction procedures, most of his patients are native Koreans, though one in 10 are foreigners – with many of those coming from the United States. Dr. Park field-tested most, if not all, of the most common calf reduction surgical procedures known today at his practice at the OZ Cosmetic Clinic in Seoul, Korea.

The end goal of a calf reduction procedure is to contour the calf to be aesthetically pleasing by reducing the overall circumference of the calf and reducing the bulkiness of the calf muscle. Think of the 'circumference' of the calf as something similar to its waistline with the end-goal being making it slimmer, while the reduction in the 'bulk' of the calf itself, so to speak, is how thick the calf is when it's in the relaxed position.

When a person walks, their gastrocnemius muscle contracts, and as a result, it bulges. Some have too much of a good thing and have an excess of muscle mass, creating the aforementioned image of a woman appearing short or bow-legged.

WHAT TO LIPO?

One of the earliest procedures indicated for calf reduction was via liposuction, where a surgeon inserted a cannula and then attempted to suck out fat from the calf. Unfortunately, since the calf is primarily composed of muscle, this method was far from effective. "The size and shape of the calves are determined primarily by muscle rather than subcutaneous fat," notes Dr. Park.

Furthermore, this method requires general anaesthesia (with its associated risks) and creates scars at the entry points where the cannula is inserted, as well as swelling and pain lasting several weeks since there isn't much fat to actually remove from the calves. Additionally, what fat there is lies close to the skin where an abundance of sensory nerves are present – which makes the recovery process painful.

"Until procedures which could reduce the bulkiness of the calf muscles itself were developed, liposuction was the only measure that could be done on the calves. Today it is rarely indicated and the results are usually unsatisfactory except in very obese people. However, it is still used today in conjunction with other calf reduction techniques," says Dr. Park.

Those desiring the safest and least invasive option with the least downtime can opt for botulinum toxin A injections. Surgeons directly inject the toxin into the calf muscle to partially paralyse sections of it. Patients can return to work the same day. In theory, the muscles remain in their relaxed, paralysed state for up to six months before requiring further top up injections. Without activity, the muscles gradually shrink lead-

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A 31-year-old woman underwent partial gastrocnemius muscle resection. After three months, the patient has a reduced calf circumference of 32.5cm from 36.5cm.

Pictures courtesy of Dr. Park Hyun Cheol.

ing to slimmer legs. The downside is that the results aren't immediate and may take weeks before they're readily visible. In addition, the cost of regular top up injections to sustain the effect adds up over time.

"When botulinum toxin A started to become popular about a decade ago in Korea, there were widespread trials that were conducted on its use on calf muscles. This technique is the simplest and safest procedure but is no longer used these days because most doctors and patients were disappointed by the limited, short term results and the high cost involved," says Dr. Park.

SEVERING NERVES

One set of techniques targets the nerves that control the calf muscles. No nerves, no muscle contraction. Without muscle contraction or movement, the muscle will eventually atrophy over time. One such technique is a 'nerve transection to the medial Gastrocnemius'. In plain English, that means severing the nerves controlling the inner calf muscles. With the nerves severed, the inner calf muscles stay relaxed and atrophy over time. The lateral gastrocnemius, or outer calf muscles, remain untouched.

The procedure itself requires general anaesthesia and was popular for a time until complications started cropping up. The trouble is that the calf muscles are like a set of counter balancing weights – if one side is weak, the other strengthens itself to compensate. Surgeons experienced cases where a patient's outer calves grew larger to make up for the lack of strength from the inner calf muscles. This growth leads to an

even more bowed look for the patient.

"This technique was developed a decade ago," says Dr. Park. "It was simple and easy to learn and this technique gained popularity among plastic surgeons but several disadvantages were found.

"There were several reports of walking disability by cutting the wrong set of nerves. The results are also minimal, with none to little decrease in the circumference of the calf. Another frequent problem is that the lateral, our outer gastrocnemius muscle, can hypertrophy (increase in size), which makes the calf look bowed."

Dr. Park also adds that this particular technique was prone to asymmetry of the calves and sometimes, the nerves could grow back, leading back to square one.

In a similar vein is a procedure that Dr. Park defines as a 'nerve ablation by radiofrequency energy or toxin'. Basically, the surgeon uses precisely targeted radiofrequency energy via a probe or toxin to either burn off or kill small sections of the nerves controlling the gastrocnemius muscle instead of surgically severing them. The procedure results in minimal scarring and can be done under local anaesthesia. The downside is that it's not very effective.

"Originally, this technique was used to treat contractures in spastic paralysis but it has been recently adopted and used for aesthetic reasons. Because of its simplicity and short recovery period, many patients still opt to undergo this procedure but the satisfaction rate is very low and many complications are reported," says Dr. Park. Among the possible complications with this proce-

dures are unpredictability in the results, frequent recurrence and the chance of injuring the wrong nerves and ending up with a permanent walking disability. Enough reason not to do it surely!

Both procedures require one week of downtime. In general, neither a nerve transection nor a nerve ablation offer consistent or sufficiently effective results.

"According to studies, approximately 15 percent of patients have anomalies in how their nerves are laid out in the body. This makes the results even more unpredictable as the surgeon will have to find and identify the proper sets of nerves to sever," says Dr. Park.

If done incorrectly, a patient could end up suffering numbness or pain, or could acquire a permanent limp. He adds, "Nerve tissue has the possibility of spontaneously growing back when it is severed. It is part of the body's built-in healing mechanism and this leads to frequent recurrence of the muscle tissue regaining function and growing back."

The high possibility of complications and lack of effectiveness means both methods are not particularly favoured amongst Korean surgeons.

REMOVING MUSCLE

The next set of techniques works to selectively destroy or remove calf muscle tissue. "Some doctors have reported using a technique known as radiofrequency muscle ablation," says Dr. Park.

With this procedure, a surgeon guides a special probe through tiny incisions in the

Pictures courtesy of Dr. Park Hyun Cheol.



A 34-year-old woman who previously had a radiofrequency nerve ablation elsewhere but was unsatisfied with the results. She later underwent a partial gastrocnemius muscle resection. There was a reduction in calf circumference from 34cm to 31cm.

back of the knee to ablate calf muscle tissue. The operation must be done under general anaesthetic and the patient normally requires two weeks to recover. In radiofrequency muscle ablation, patients could suffer from asymmetrical calves if the surgeon removes more muscle in one calf over the other, as well as possible nerve injury, though this is unlikely in the hands of a trained surgeon.

"The advantage of this technique is that it offers minimal scarring. In terms of results, it is not as effective as a partial muscle resection procedure and revision surgery is very difficult after a patient has conducted this procedure because of the amount of internal scar tissue created within the muscle," says Dr. Park.

PARTIAL MUSCLE RESECTION: THE BEST OPTION?

The most effective technique by far, that delivers the most consistent and predictable results, is what is known as a partial muscle resection. Under general anaesthesia, the surgeon makes a small incision behind the knee and then removes small strips of the gastrocnemius muscle.

"I think that this is the ultimate procedure for calf reduction and it is the safest and most effective method," says Dr. Park. In terms of results, Dr. Park reports that of all the procedures, a partial muscle resection is the one that is the most consistent at eliminating the calf muscle bulge and dramatically decreasing calf circumference to create aesthetically longer and slimmer legs. The procedure is highly predictable because the surgeon doesn't tamper with sensitive nerve tissues and simply removes a certain

amount of muscle tissue, based on what the patient desires. This procedure also requires two weeks of recovery time.

WHICH PROCEDURE IS RIGHT FOR ME?

A prospective patient for calf reduction surgery should be in good health and naturally have an interest in having better-looking calves.

"Some individuals think they have thick or muscular calves or want to improve their calf shape more even though they already have good looking calves," says Dr. Park. "If a patient is in good health and has realistic expectations, then they are good candidates for calf reduction surgery."

For those who suffer from asymmetric calves because of an accident or disease, calf reduction surgery represents an option for patients to actually enjoy symmetrical calves, making it in equal parts an aesthetic and corrective procedure.

The procedures mentioned all have tradeoffs in terms of results, potential downtime, potential complications and cost. Prospective patients will have to prioritise what they want the most – be it minimal downtime or the procedure offering the most results and how far they're willing to go. For the most part, a calf reduction procedure is permanent and irreversible.

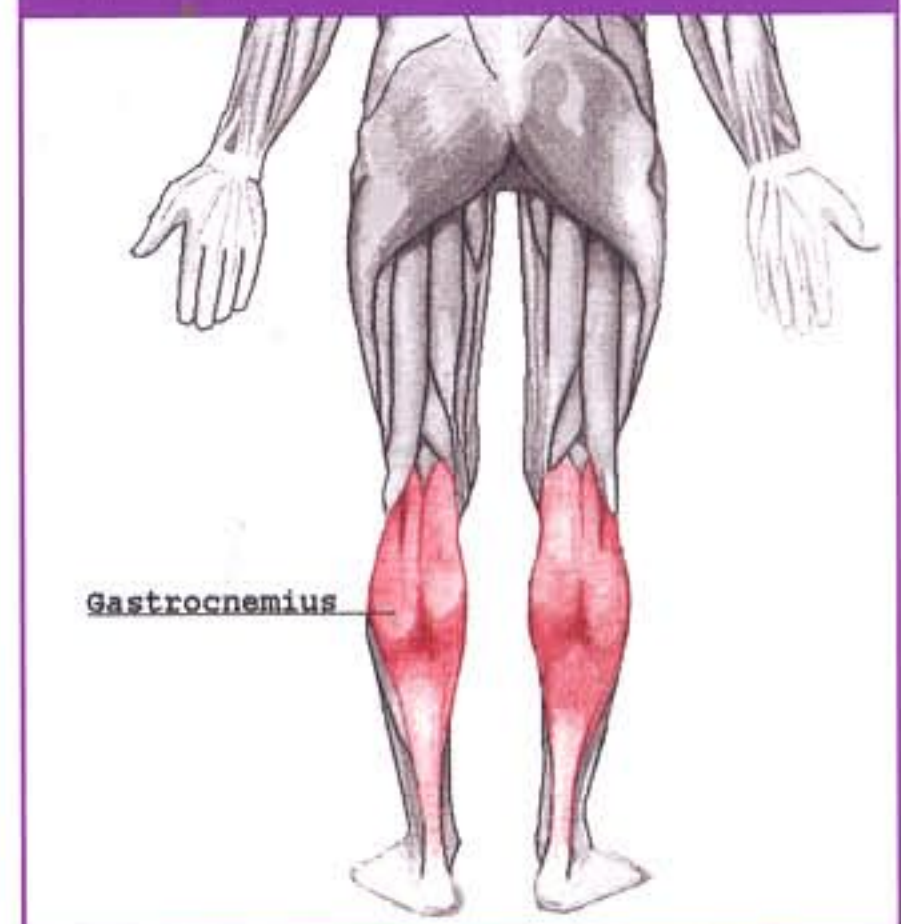
Patients must also factor in the fact that not all surgeons are trained in all the techniques mentioned and finding one who performs the procedure may be a difficult quest in itself – as is finding one who is experienced enough to do it safely.

At an entry level, a patient can opt for botulinum toxin A injections at US\$1,000

THE IDEAL CALF?

If one were to look under the hood, the calves primarily consist of muscle. The characteristic bulge of the calves – just behind and below the knee – is created by the gastrocnemius, or calf muscle. The muscle in its entirety serves to provide the downward force when running and jumping. Savvy shoemakers homed in on this idea and created the icon of womanhood – the high heel. When a woman wears heels, the structure of the heel points the toe downwards and this forces the gastrocnemius muscle to contract, thus creating the shapely leg curves that all (well, mostly all) women aspire to.

The calf muscles, otherwise known as the gastrocnemius muscles in medical parlance, are subdivided into two halves known as the inner (or medial gastrocnemius for you boffins) calf muscles which face each other and the outer calf (or the lateral gastrocnemius muscle) muscles that face outwards. Aesthetically speaking, the length of the ideal calf should be 22 percent of a person's height from head to toe (without heels – no cheating!), while the circumference (or 'waistline') of the calf at its thickest point should be about 20 percent of the person's height.



Gastrocnemius muscle

Drawing extracted from Wikipedia: The Free Encyclopedia.

(RM3,447) a session, all the way to US\$6,000 (RM20,679) and up for a partial muscle resection procedure. That's not all though, as other costs still have to be factored in – accommodation, medication, overnight hospital stays and for Malaysian patients, they'll also have to factor in the cost of airfare and other travel costs. **4815**