King's College Hospital
NHS Foundation Trust

Thoracodorsal artery perforator (TDAP) flap

Information for patients

This leaflet explains more about TDAP flaps to fill defects on the leg, including the benefits, risks and any alternatives. It also provides information on what to expect when you come to hospital. If you have any further questions, please speak to a doctor or nurse caring for you.

What is a TDAP flap?

A thoracodorsal artery perforator (TDAP) flap is a piece of skin and fat (and sometimes a small bit of latissimus dorsi muscle) which we can move from your back/chest to your leg, to reconstruct (fill) a defect (hole) that will not heal on its own. It is called TDAP because the blood vessel that keeps it alive is a branch (or 'perforator') from an artery called the thoracodorsal artery.

We need to cut the TDAP artery supplying blood to the piece (or 'flap') of skin and fat, as well as the vein draining blood away, so that we can move it to its new place on the leg. We then re-join the artery and vein to another artery and vein in the new place where we want the 'flap' skin and fat to be. This is called a free tissue transfer or free flap. We then stitch the flap in its new place leaving a round or oval scar. We then stitch the cut skin edges together where we have taken the flap from (the donor site), leaving a permanent scar.

Why should I have a TDAP flap?

Your surgeon has recommended a TDAP flap either because the hole in your leg will not heal on its own, or there is a risk of infection if skin and fat is not provided to cover the bone (and sometimes metalwork) underneath, quickly. There is not much spare skin on the lower leg, particularly around the ankle so, unless holes are small, we often need to borrow skin and fat from somewhere else in the body. If the distance is too far between where we are borrowing this tissue from to where it needs to go, we need to disconnect and then reconnect the blood vessels to the flap in the new place (free tissue transfer or free flap).

What are the risks?

As with any operation, there are risks involved with having this procedure. The potential benefits of the surgery must be carefully weighed against the possible risks. These should be discussed

with your surgeon prior to your surgery, to make sure you understand the potential complications and their consequences. There are risks associated with the surgery itself and risks associated with the general anaesthetic. Also, it is important to understand that there will be a period of time after the operation where you will need to take things very easy and do your physiotherapy and exercises at home in order to get the best possible outcome from your surgery.

Risks associated with TDAP flaps:

Flap failure
The main risk is that part or all of the TDAP flap may not survive in its new position.

Sometimes a part of the flap does not get enough blood or blood drainage from the artery and vein going in or coming out, in which case part of the flap might die. Usually this creates an area which takes longer to heal but it is not a major problem.

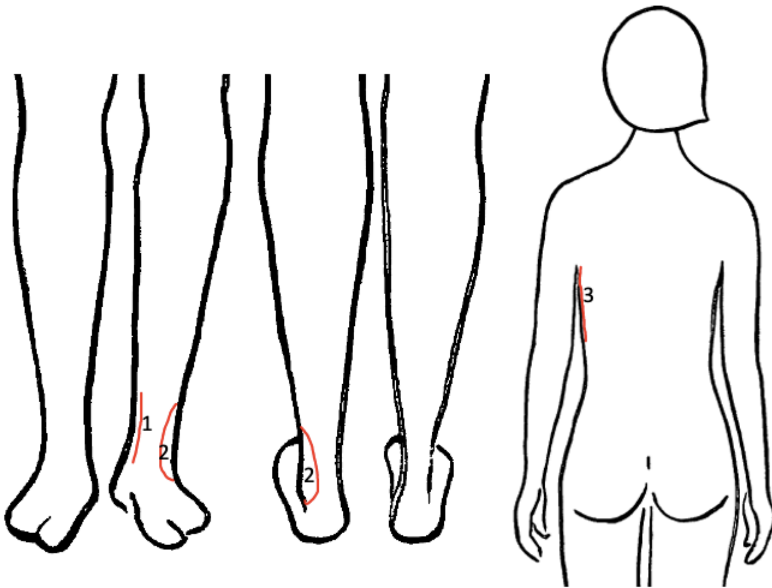
If there is a problem with the whole artery or vein, the entire flap can lose its blood supply. This can be because the blood vessel has twisted on itself, there is pressure on the blood vessel, or because there is a blood clot blocking one of the pipes. The most common time for this to happen is in the first day or two after your surgery, and so you will be closely monitored by the nursing and surgical team looking after you. If there are any concerns, you may need another operation and, usually, the problem can be sorted out, although it might mean that you stay in hospital for an extra day or two. If the problem is not sorted out, and the flap dies, you may need to have another flap made another day. This happens in about 4 in 100 patients (or more often if you are diabetic or have significant vessel damage or injury in your legs).

Flap contour deformity
It is unusual that the flap exactly matches the outline of your leg – it can be too thin or (more commonly), too fat. If this is the case, it can be tweaked with a much smaller operation once it is well-healed, usually at least 6 months after your first operation.

Risks associated with surgery:

Bleeding
Heavy bleeding is unusual but possible, either where the flap is or where it was taken from. It usually happens immediately or soon after surgery. It may result in the development of a haematoma (which is a painful swelling due to the collection of blood) and you made need to be taken back to theatre, under a further general anaesthetic, to stop the bleeding. To reduce the risk of bleeding, you may be asked to stop any medications or supplements that may act to thin your blood before your surgery.

Scars
There will be scars from your surgery, and an example of possible scars is shown below. You will have a permanent scar where we have taken the skin and fat from, on your back/side (3) with a bit of an indent because we have taken some of the tissue away. You will also have a scar around the flap where the hole used to be (2), and sometimes a second straight or curvy scar over the top of the foot or the inside of your ankle (1), which is where the new blood supply to the flap comes from.



Scars will usually be red and slightly raised at first, they then will go purple and then will fade to become paler over 12 to 18 months. During this time you will be given advice about how to moisturise and massage your scars in order to ensure you get the best possible outcome. Occasionally scars can be problematic in that they may become wider, thicker, red, itchy or painful. You may need to have additional treatment or surgery to help correct this.

Infection

Infection is always possible, although we do everything in sterile conditions inside the operating theatre. To help try and prevent this you will be given one dose of intravenous antibiotics during your operation. You are not routinely given further doses afterwards. If you develop an infection you may need additional antibiotics and, occasionally, further surgery. Smoking and poorly controlled diabetes will increase your risk of developing an infection.

Swelling and pain

There will be some swelling of your leg and it will be tender for some months or even years after the surgery, but this pain should be controlled by tablet pain killers after the first day or two. Gently elevating the leg on one or two pillows at rest will help to reduce the swelling and pain.

Altered flap sensation or numbness

The skin that we have moved will always feel numb compared to the skin around it, but may improve slightly over time around the edges.

Wound healing problems

Sometimes wounds take longer than normal to heal, or the edges come apart. This can prolong recovery and make scars worse. Smokers are more likely to have wound healing problems.

Damage to deeper structures

This is rare, but the surgery can damage deeper structures, including nerves and blood vessels in the leg. This damage may be temporary or permanent and may require you to have further surgeries.

Risks of anaesthetic:

These will be discussed with you by your anaesthetist in detail but include:

Chest infection
This is a small risk, but the risk is higher if you are a smoker.

Blood clots
Blood clots can form in the leg (deep vein thrombosis – DVT). These cause pain and swelling and need to be treated with blood thinning medication. Rarely, parts of these clots can break off and go to the lungs (pulmonary embolus – PE). This can cause difficulties in breathing and can cause death. The risk of this is higher if you have been in a big accident leading to the admission, smoke, are overweight or are taking the oral contraceptive pill.

Heart attack, stroke or death
As with all operations there is a risk of heart attack, stroke or death, however, you will be assessed pre-operatively to ensure it is as safe as it can be for you to have your operation. This will include optimising any other medical conditions you may have, stopping smoking and ensuring you are at a safe weight, where possible.

Are there any alternatives?

There are several alternatives to this procedure which may or may not be suitable for you depending upon your reason for needing the procedure in the first place. Your surgeon will discuss these options with you prior to your surgery:

1) Do nothing. If a wound on your lower leg is unable to heal, doing nothing will usually result in severe infection and failure of any underlying bony injury to heal, which may then lead to the involved leg requiring amputation.

2) Skin graft the area. Skin grafts are thin layers of shaved skin, taken from an area of your body (often your thigh) and then transferred onto the wound. They need a healthy wound bed that can grow into them and give them a blood supply. Bare bone or tendon is unable to offer this healthy wound bed and therefore cannot keep a skin graft alive. If the area has a lot of rubbing (for example, from a shoe), or is on the weight bearing part of your foot, a skin graft will not be as durable or comfortable as a flap like an TDAP with skin and fat.

3) Alternative flap. There are other flap options available, but the advantage of the TDAP flap is that the fat layer is very thin, so it is less bulky than flaps taken from other areas of the body with more fat, like the thigh or stomach. In appearance, and when it comes to fitting on a shoe or boot, this is important.

How can I prepare for my TDAP flap?

If your flap surgery is being planned electively, it is important to stop smoking, get to a normal weight if you are over or underweight, and optimise any long-term health problems like diabetes, heart or lung disease.

As the procedure is performed under general anaesthesia, you will be told to fast for 6 hours before the operation. This means that you must not eat anything for 6 hours before your operation. You may drink water only during this time, but must stop 2 hours before the operation. For these 2 hours you must not eat or drink anything.

You will be seen and examined by the anaesthetist and your surgeon before the operation. The surgeon will also place some markings on your legs which will be crucial for the operation. It is important not to rub these marks off.

Giving your consent (permission)

We want to involve you fully in all decisions about your care and treatment. If you decide to go ahead, you will be asked to sign a consent form. This states that you agree to have the treatment, any alternative procedures have been made clear to you, and you understand what it involves, including possible risks and complications.

If you would like more information about our consent process, please speak to a member of staff caring for you.

What happens during a TDAP flap?

The hole in your leg will be prepared for the flap to be put there. The edges will be cleaned, any infection will be cut away, any bone fractures will be stabilised with plates and screws or nails (this will have been discussed with you before), and your surgeon will find the blood vessels which the flap will be attached to. Usually at the same time, the TDAP flap will be designed, cut out and the blood vessels carefully followed up towards the armpit until there is enough length of these vessels to be 'plumbed in' to their new blood supply. To do this, your arm will be held out from your body on an arm board, and may be moved around above your head at certain times, but your shoulder will be carefully supported. The flap will be disconnected from its old blood supply and reconnected to its new blood supply, and then will be stitched into its new place. The skin edges will be closed where the flap was taken from (this is called the donor site). The wounds will usually be closed with absorbable sutures, which means you do not need to have them removed.

Usually, a soft ('Yates') drain is left poking out from under the flap, to drain any blood or fluid away, and this is removed after two days. Rarely, a drain (a tube attached to a bottle or bag) is left in the calf to drain away any fluid or blood, which would normally be removed the following day.

This operation usually takes 6 hours or so.

Will I feel any pain?

When you wake up your leg may feel tight and swollen. This will improve gradually during the next couple of weeks. You will be given regular pain relief after the operation and you will also have some pain relief that you can ask the nurses for, if the regular pain relief is not sufficient.

What happens after a TDAP flap?

Following your surgery you will wake up from your anaesthetic in recovery where a nurse will be looking after you. You will be able to have sips of water as soon as you have woken up from your anaesthetic and during the first night. Your surgical team will see you in the recovery and once they and your nurses are happy, you will be transferred to a high dependency ward, and later a normal ward. During your time in hospital, your flap will be checked frequently, to make sure that the blood is flowing in and out of it well enough by looking at it, pressing it gently, and using an ultrasound probe to hear the blood flow. The first night, this is every half an hour. This can be very disruptive but gets less frequent over the following days. You will also have a 'bair hugger' which is a warming blanket over the leg, to keep the flap warm. This is usually removed the next day. Once you have been seen the following morning by the surgical team, you will be allowed to eat and drink normally.

You will usually stay in hospital for about 5 days. For the first three days, you will be elevating the leg, and the nurses will help you to use a bedpan to go to the toilet. After three days, the physiotherapists will show you how to wrap your leg in a double tubigrip (an elastic bandage), and ‘dangle’ the flap, for 15 minutes four times per day. This helps the flap get used to its new position on the leg. On the fourth day, the physiotherapists will get you up and about, and may allow you to put some weight through the leg (depending upon what you have had done to any bone fractures). You will be reviewed by your surgical team every day during your hospital stay and, once they are happy, you will be allowed to go home.

While you are in hospital, nurses will regularly check your observations (heart rate, blood pressure, temperature, oxygen levels, urine output) to make sure you are recovering well. If you have drains, they will also monitor the output in these, until they are removed. They will also give you an injection into your tummy or thigh every day whilst you are an inpatient with a medication to thin your blood, which helps to prevent blood clots forming in the leg (DVT) or lung (PE).

What do I need to do after I go home?

You will need to take it easy at home until everything has healed. When you are at rest or asleep, you should elevate your leg on one or two pillows. You also should be careful about lifting your arm above your head, or using a crutch on that side, particularly in the first two weeks, as it can pull on the scar. The physiotherapy team will instruct you regarding weight bearing through the affected leg, exercises, and activities at home depending on the reason for your operation. You will not be able to exercise normally for several months. You will also not be able to drive until everything has healed and is pain-free enough not to distract you and so that you can do an emergency stop. You will need to keep your leg in a tubigrip to help reduce swelling and we will arrange for a custom made elasticated sock to be made for you when you come back to clinic. This needs to be worn during the day but can be removed at night.

It is important to look out for any signs of infection around the flap or where we took the flap from. These include: increasing pain, redness, swelling, or leaking from around the wounds, or more general signs, such as having a fever or feeling generally unwell/nauseated. If you have any of these symptoms you must contact your GP or a member of the surgical team.

Will I have a follow-up appointment?

You will be given an appointment to come to our Plastics Dressing Clinic for a review of your wounds a week after you leave hospital. You will also be given an appointment to come back to your Consultant Outpatient Clinic for review usually 2 weeks after your surgery, for wound, flap and bone healing checks, and then as required. We will organise these appointments for you and you will either be given the date and time of them on your discharge summary from hospital or you will be informed via text or letter once you are at home.

If you have any problems with your wounds or have any concerns you will be given an information leaflet with the contact numbers on of different members of our team including our dressing clinic nurses and the on-call plastic surgical team.

Useful sources of information

The British Association of Plastic and Reconstructive Surgery (BAPRAS) provides detailed information regarding lower limb injuries. Find BAPRAS lower limb patient information here:
www.bapras.org.uk/public/patient-information/surgery-guides/open-fractures-of-the-lower-limb

Contact us

If you have any questions or concerns about your lower limb flap, please contact our Senior Lower Limb Reconstruction Nurse Specialist, Krissie Stiles, call the hospital switchboard on **020 3299 9000** and ask for Wi-Fi phone **38567** or email k.stiles@nhs.net
Krissie is available Monday and Tuesday, 8am to 8pm and Wednesday 8am to 4pm.
At other times, please contact the Senior Orthopaedic Trauma Coordinators (see below).

If you have any concerns about your bone healing, please contact our Senior Orthopaedic Trauma Coordinators, Dawn James and Emma Harris on: **020 3299 5197**

Sharing your information

We have teamed up with Guy's and St Thomas' Hospitals in a partnership known as King's Health Partners Academic Health Sciences Centre. We are working together to give our patients the best possible care, so you might find we invite you for appointments at Guy's or St Thomas'. To make sure everyone you meet always has the most up-to-date information about your health, we may share information about you between the hospitals.

Care provided by students

We provide clinical training where our students get practical experience by treating patients. Please tell your doctor or nurse if you do not want students to be involved in your care. Your treatment will not be affected by your decision.

PALS

The Patient Advice and Liaison Service (PALS) is a service that offers support, information and assistance to patients, relatives and visitors. They can also provide help and advice if you have a concern or complaint that staff have not been able to resolve for you. The PALS office is located on the ground floor of the Hambleden Wing, near the main entrance on Bessemer Road - staff will be happy to direct you.

PALS at King's College Hospital, Denmark Hill, London SE5 9RS
Tel: **020 3299 3601**
Email: kch-tr.palsdh@nhs.net

You can also contact us by using our online form at **www.kch.nhs.uk/contact/pals**

If you would like the information in this leaflet in a different language or format, please contact PALS on 020 3299 1844.

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