A guide to assisting at surgical operations 2: handling surgical instruments

Introduction

During most operations, the instruments are kept on the scrub nurse's trolley. Here they can be kept regimentally clean and ordered. The surgeon (or assistant) can therefore simply ask for an instrument, hold out one hand without taking his or her eyes off the operation, and the instrument will appear in the hand, correctly oriented and ready for instant use. It is therefore bad practice to hoard instruments out of the scrub nurse's reach, just in case you might need them at some later stage of the operation. For the same reasons, you should also avoid helping yourself to instruments from the trolley: you are being treated to silver service, so don't turn it into a buffet.

Some surgical instruments look similar to common household tools, such as scissors or tweezers. Although you may feel that you can already use such tools skilfully, the way you hold and use them is almost certainly not the standard surgical method. It is important that you cultivate the habit of using the standard surgical grips described below. Surgeons themselves use these grips because they give the best control of the instruments. Furthermore, using any other grip will immediately mark you out to the surgeon's eye as a complete novice to the operating theatre.

Scissors

As an assistant, the most likely purpose for which you will need scissors is to trim sutures after they have been placed in the wound. The best scissors to use are simply those you are given for the purpose by the scrub nurse.

Use the correct scissor grip (*Figure 1*). Because scissors have finger-sized holes ('bows') in the handle, it is easy to think that the fingers should be inserted right through them. However, this is not necessary, and indeed, tends to make them more awkward to handle. Notice how the ring finger, thumb and index finger form a triangle, which from an engineering viewpoint is a rigid, stable structure. This gives precise control of the instrument. Whenever possible, stabilize the scissor blades by resting them on something else, ideally the index finger of your opposite hand.

Cut near the tips of the scissors, not down near the pivot. This gives more precise control, and helps you avoid inadvertently cutting something else.

Good scissors, used correctly, will cut through most suture material with a single cut. If they do not, sometimes you can improve their cutting ability by supinating your wrist slightly, so that the blades are at an angle of about 45° to the suture material (*Figure 2*).

Sometimes the suture material gets stuck between the closed scissor blades, without being completely divided. Pulling your hands away rapidly in this situation is likely to tear the ligated structure. Therefore, after cutting the suture, pause for the briefest moment to ensure the suture material is completely divided, before pulling your hands away.

When their sutures are being cut, some surgeons are difficult to please; the suture is either too long or too short. If you are unsure how long to cut a suture, the simplest and best method is probably just to place the scissors about 4 mm above the knot, ready to cut, and then check with the surgeon if that distance is correct before cutting.

The surgeon may ask you to 'clip and cut'; this means you place an artery clip on

Figure 1. Correct scissor grip.

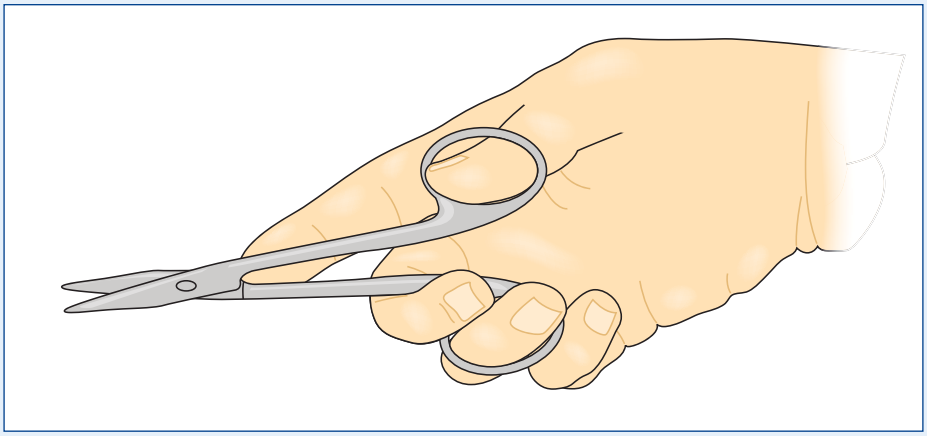
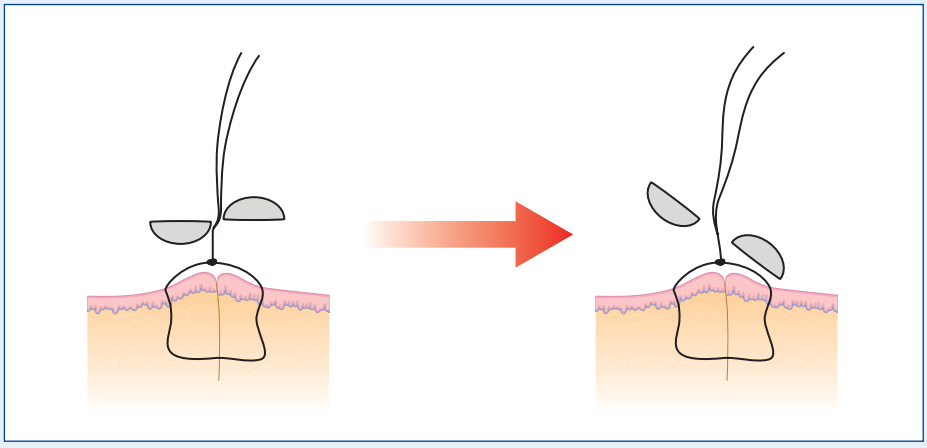


Figure 2. Angling scissors to improve suture cutting. (The scissor blades are shown end-on.)



Mr Comus Whalan *is a Visiting Surgeon, Noarlunga Health Service, Noarlunga Centre, South Australia, 5168*

the suture material (typically about 15 cm from the knot) and cut just beyond the clip, thus securing the free end of suture material with the clip. Sometimes, numerous clipped free ends of suture material are formed. These clips, with their attached suture material, can easily become tangled together. To avoid this, as each clip is applied, thread a finger-ring of each clip sequentially onto a closed single long clamp, such as a Black's.

Releasing clips

It is often necessary to release clips with the left hand. Because clips are sprung for right-handed use, it is very awkward to use a grip that is simply a mirror image of the normal right-handed grip. Instead, use the grip shown in *Figure 3*. Cradle the clip gently, to avoid tearing the tissue in the clip. Raise and then lower the handles like a see-saw to allow the surgeon to pass suture material around tissue.

Forceps

Always hold forceps like you would hold a pen, and not like a stapler. That is, hold them so that they rest in the web-space between your thumb and index finger, not tapping against your palm (*Figure 4*).

Suckers

These instruments suck fluids out of surgical wounds via small holes at their tips. Some also have another hole higher up, in the handle. This lets in atmospheric air, therefore decreasing the strength of suction at the tip and making it more suitable for delicate work. The hole is designed to be occluded by your finger or thumb, as needed.

During operations, small amounts of blood and exuded tissue fluid often pool at the depths of the wound. When the surgeon is operating in those depths, you (the assistant) must remove this fluid, so that the surgeon can see what he or she is doing. It can be difficult to steer the correct middle course between sucking too much and not enough. Too much, and the sucker will clash against the surgeon's instruments and interfere with the operation. Not enough, and the fluid will accumulate and obscure the operating area. Sometimes, a skilful assistant can develop a rhythm with the operating surgeon, timing quick gentle dabs with the sucker so that they alternate with the surgeon's cuts: suck, cut, suck, cut (*Figure 5*).

Retractors

Hold the retractor by its handle; do not allow your hand to creep down the shaft of the instrument so that you are holding it close to the lip. If your hand is in the wound, it may obstruct the surgeon's view, and you risk a sharps injury.

You may have to keep quite still in one position for long periods. Therefore, as far as possible, try to make sure that position is reasonably comfortable.

Surgeons adjust retractors so that they expose the operative field in the most useful way. This applies both to self-retaining

Figure 3. Releasing clips.

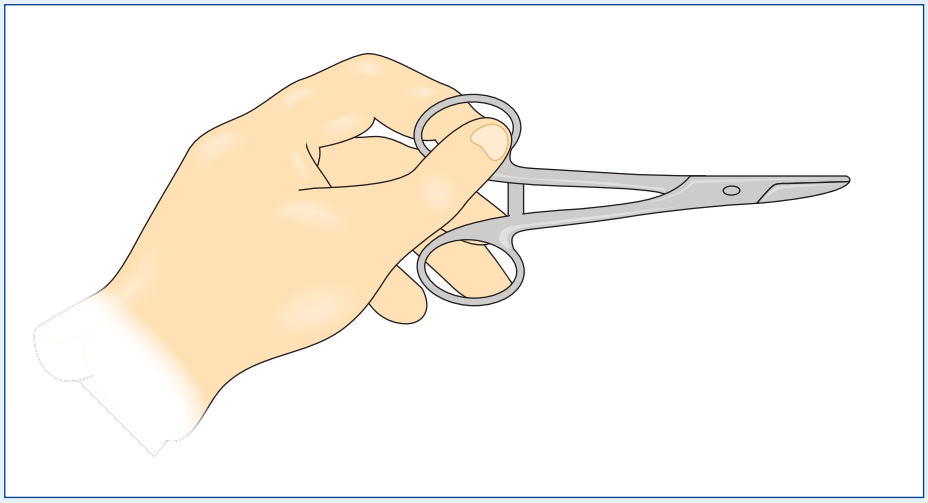


Figure 4. Correct and incorrect way to hold forceps.

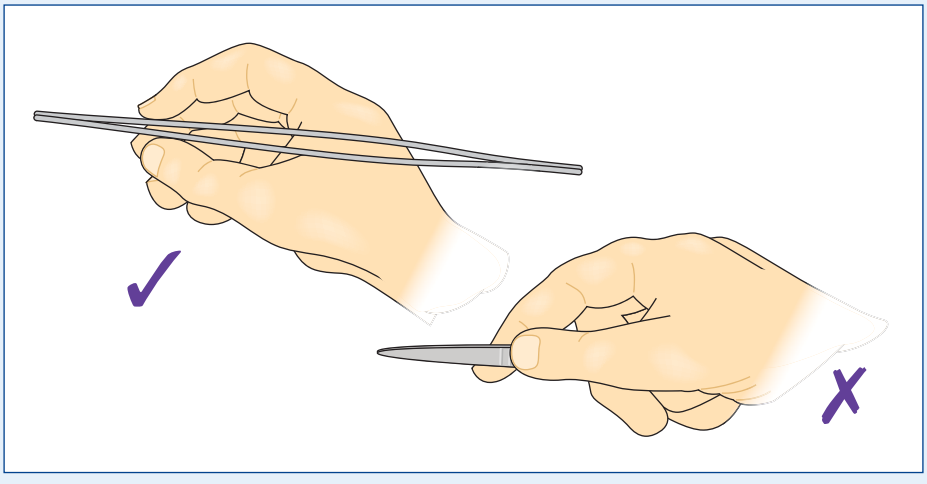
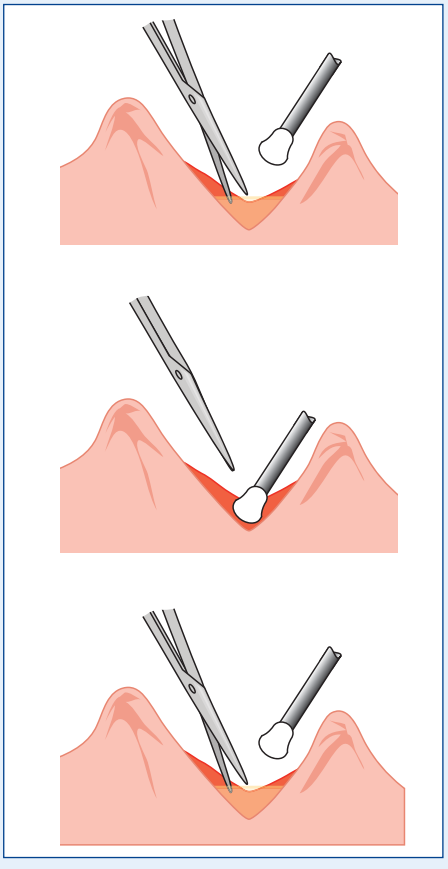


Figure 5. Alternating suction with the surgeon's cuts.



and hand-held types. In an open wound, this often means creating the largest surface area of wound for a given incision, with the site of surgical action in the middle. Usually this involves placing retractor blades at intervals around the wound edge, so that they are evenly spaced and all pulling away from the centre of the wound.

Sometimes a surgeon will place your retractor in the wound, and then pass it to you to retract. In this case you should hold the retractor at the same angle and tension that the surgeon gives it to you. More often, the surgeon will simply allow you to hold retractors as you see fit. As a general rule, aim to keep the surgeon's operating instruments (i.e. scissors, forceps), especially their tips, free from impediment by surrounding tissues.

Retraction is easier if your hand or wrist is resting on something (usually the patient's body beneath the drapes) rather than being poised in mid-air. It is surprisingly easy to become so engrossed in an operation that you forget that there is a complete human being under the surgical drapes, and lean on him or her if you become tired. Gentle resting is usually reasonable. However, if you think the patient would find your hands uncomfortable if he or she were awake, they should not be there while he or she is under anaesthetic.

During most operations, the site of the surgical action will move. Do not feel that you and your retractors must always remain frozen, statue-like, in one position until told otherwise. While it is sometimes necessary to remain immobile when the site of surgical action is stationary, it is of no benefit to continue doing so when the action has moved elsewhere. Instead, re-adjust your retractors so that you are providing the best view for the surgeon.

It is especially important that the 'lip' of a retractor in the depths of the wound is kept correctly positioned. Often the lip plays the most important part in tissue retraction (because it is closest to the action), but it can be the hardest part to see. Therefore, whenever possible try to see into the depths of the wound, when that is where the surgeon is operating. This will also help you to follow and understand the operation better.

Ensure that the lip of the retractor is in the correct plane. Inexperienced assistants often allow the retractor to slip out of the wound slightly, so that its lip is lying too superficially. When this occurs, the deeper tissue layers are free to interfere with the surgeon's actions. Allowing just one tissue layer to lie free beneath the retractor's lip will often interfere greatly with the surgeon's task.

Novice assistants sometimes pull very hard when retracting, perhaps in their enthusiasm to be helpful. However, this should be avoided whenever possible. When stretched, soft tissues behave rather like a rubber band. That is, a rubber band stretches easily up to a certain point, beyond which even a lot of force will stretch it only a little more, before breaking it. In the same way, retracting hard on tissues risks injuring them and does not usually give much improvement in exposure. It is also tiring. If exposure of the operative site is inadequate, the surgeon will usually use some other manoeuvre, such as enlarging the incision, instead of hard retraction.

There are rare occasions when assistants are required to retract strongly. For example, when operating deep in the pelvis, it is usually not possible to improve access by enlarging the incision. (This is because in this situation, surgical access is limited by the narrow bony pelvis, and not by the skin and soft tissues.) It is often possible to make strong retraction easier by using your body weight instead of muscular effort, i.e. by leaning over slightly in the appropriate direction. This is much less tiring. Where possible, bracing your elbows against your torso may also help. If you become tired, and feel that you are unable to continue holding the retractor or limb in its required position, tell the surgeon. Ask if it is possible to pause for a moment while you re-adjust your grip. While you may feel embarrassed by this, it is far better than continuing silently, then suddenly losing your grip while the surgeon is operating.

During the course of most operations, there will often be brief periods when your retraction is not needed. For example, the surgeon may pause briefly to change instruments. During these times, it is often beneficial to both the patient's tissues and your arms to relax your retraction, and then carefully resume it as the surgeon returns to the operative site.

Diathermy

To coagulate a bleeding point, a surgeon may grasp it with forceps, and ask you to touch the diathermy against the forceps. To avoid obstructing the surgeon's view, touch the blade near the top of forceps, not down near the tips.

If the diathermy the surgeon is using does not have an attached smoke evacuator, and you have a free hand, use the sucker to remove the smoke. **BJHM**

This article has drawn heavily upon material published within Whalan (2006) and is reproduced by kind permission of Cambridge University Press.
Conflict of interest: none.

Whalan C, ed. (2006) *Assisting at Surgical Operations. A Practical Guide.* Cambridge University Press, Cambridge

KEY POINTS

- The scrub nurse's role is important – avoid hoarding instruments or taking them yourself from the instrument trolley.
- Learn the proper methods of holding surgical instruments.
- Handle tissues gently.
- Follow the operation and adjust retractors to give the surgeon the best view.