

Plastering techniques for GPs.

Part 1: Colles' fracture cast

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In this two-part article, plastering techniques will be discussed through the examples of a Colles' fracture cast (part 1) and a volar forearm slab (part 2, in our next issue). Almost all other plasters are variants of these two examples, differing only in site and size.

Throughout this article, I will describe what I do. However, these are only my personal preferences and do not exclude other preferences, techniques and 'tricks of the trade'.

Preparation for plastering

Where possible, I prefer to have the patient lying down on a bed or couch (or something similar), with the patient at a comfortable working height so that I do not have to bend forward awkwardly. I arrange as much surrounding working space as possible, using protective covers for the floor, the working area, the patient and the bed. The required materials are placed in a bowl conveniently nearby, adjacent to a bowl of water sufficiently deep to cover a roll of plaster of Paris placed in it – 10 cm is a good depth. I use only cold water, to ensure the greatest possible time until the plaster 'sets'. This provides more time to mould the cast, ensure an optimal position and 'work' the plaster to a smooth finish.

Colles' fracture cast

It is essential to understand how to put on a plaster for Colles' fractures. They are the 'bread and butter' of any doctor in general practice.

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Requirements

A Colles' fracture cast requires two 10 cm rolls of plaster of Paris, such as Gypsona (see the Table for amounts required by other types of cast). Some form of underpadding (pure cotton or synthetic material) is needed – I prefer Soffban. I use extra padding over the ulnar styloid process, such as Webril, or a few layers of Soffban. (To do so, I fold a length of Soffban twice over itself, to form a two- or three-layered thickness that can be cut to size and placed over the styloid process to protect against undue or excessive pressure.) Also required are stockinette and a pair of scissors.

Fibreglass materials are stronger than plaster of Paris, but I cannot mould the fibreglass materials as well as the plaster of Paris. For a snug-fitting, well-moulded cast, I always use plaster of Paris. If greater strength is needed, I may use only one roll of plaster of Paris, applied first and

moulded, then I reinforce with a fibreglass material, such as Dynacast.

Cautionary notes

Some stocking-shaped materials are elasticised (e.g. Tubigrip and Flexigrip). These materials are constrictive and should never be used under a plaster cast. They have an appropriate place in patient rehabilitation, as a means to prevent soft tissues swelling, but have NO place in plaster casts, ever.

Nonelasticised stocking-shaped materials, such as stockinette, are thin, stretch easily and do not constrict. Only these stocking-shaped materials are suitable for use under a plaster of Paris cast.

The newer forms of fibreglass casting material are increasingly elastic and therefore should not be used as the first cast layer. Also, fibreglass can irritate the skin if it is not applied over a protective layer of material. Cold water must be used because fibreglass can produce heat.

Procedure

Having reduced the fracture and with the patient lying supine, I place the patient's elbow on the table with the forearm pointing upwards, and the hand drooping down with the wrist flexed (Figure 1). Have both rolls of Gypsona open ready for use, with the end of each roll pulled out to form an easily accessible 'tag' (Figure 2).

Use a length of stockinette measured along the patient's forearm and cut to an oversize, so the ends can be folded back on

Table. Suggested plaster usage

Colles' fracture	Two 10 cm rolls (minimum)
Scaphoid fracture	Two 10 cm rolls (minimum)
Full arm cast (above elbow)	Three 10 cm rolls (minimum)
Below knee (non-weight-bearing)	Three 15 cm rolls (minimum)
Below knee (weight-bearing)	Five 15 cm rolls (including one roll for slab for boot)
'Stovepipe' cylinder	Six 20 cm rolls (minimum)
Above knee	Eight 20 cm rolls (two-thirds for slab)

continued



Figure 1. Patient and work area ready.



Figure 2. Materials ready to use.



Figure 3. Measuring the stockinette.



Figure 4. Cutting a hole for the thumb.



Figure 5. Placing the stockinette on the arm.

the plaster cast later (Figure 3). A small nick to one side of the stockinette, cut near the end, provides an access hole for the patient's thumb (Figure 4). The stockinette is placed over the forearm, ready for application of the cast (Figure 5).

To place the extra padding over the

ulnar styloid process, take the Soffban and near the end of the roll create a hole for the thumb (Figure 6). Place the Soffban over the thumb (Figure 7), roll it around the hand, and create another hole to accommodate the thumb. Then wind the Soffban around the forearm,

overlapping 50% each time (Figure 8) while progressing up the forearm towards the elbow. If the overlapping is done carefully, unnecessary ridges can be prevented. I stop just short of the elbow, planning that the Gypsona will extend to a point two fingerbreadths below the elbow crease.

Before I 'dunk' the Gypsona roll into the basin of cold water, I free the end of the roll, to allow easy access to it when it is removed from the water (Figure 9). Bubbles emerge from the plaster roll (Figure 10); when they have ceased, remove the plaster roll from the water. Apply a slight twist to the plaster roll to gently squeeze out any excess water (Figure 11). Do not squeeze excessively. If you do, all the Gypsona will be extruded,



Figure 6. Making a thumbhole in the Soffban.



Figure 7. Rolling Soffban around the hand.



Figure 8. Winding Soffban around the arm.



Figure 9. Freeing the end of the Gypsona.



Figure 10. Immersing the Gypsona roll.



Figure 11. Gently squeezing out water.



Figure 12. Direction change towards thumb.



Figure 13. Curving around base of thumb.



Figure 14. Going between thumb and finger.

leaving only a bare gauze bandage that cannot do the job.

Apply the plaster around the forearm, commencing at the wrist and moving distally first. While the plaster is wet it can be applied along a curved path, around the base of the thumb and then between the thumb and index finger. There is a simple 'trick' one can use to achieve this. After curving around the base of the thumb, hold down the distal edge of the plaster bandage with your thumb (Figure 12). This allows you to change direction, so that you can apply the distal edge of the bandage along a line just short of the patient's knuckles and in line with the patient's distal palmar crease. In the palm, hold down the distal edge of the bandage, in line with the distal palmar crease, before curving the roll around the base of the thumb again (Figure 13).

When passing around between the thumb and index finger, turn the bandage onto its side, squeezing the plaster into a narrow band, to prevent it from holding the thumb and index finger apart once it is dry (Figure 14).

Continue proximally up the forearm, overlapping 50% with each turn (Figure 15). Apply the plaster up to a line 2 cm short of the elbow crease. Once the plaster is applied, smooth it out gently (Figure 16). Then fold the end of the stockinette over the edge of the plaster, to create a soft, rounded edge (Figure 17). Distally, fold the end of the stockinette over the

edge of the plaster at the distal palmar crease, so that the cast will not interfere with flexion at the metacarpophalangeal joints. Circumduct the thumb on its base so that it moulds the strip between the thumb and the index finger into a 'form fit' (Figure 18).

Apply the second roll of Gypsona over the first layer of plaster following the same principles.

After a while the plaster bandage may

pull skew, and when this occurs the transverse fibres of the bandage run obliquely, resulting in an ever-narrowing bandage (Figure 19). To correct this, I create a typical seamstress 'tuck', to realign the transverse strands correctly. The way to do this is quite easy. Identify where the obliquely running transverse fibres of the bandage touch the forearm cast (Figure 19). Grab the other ends of those obliquely running fibres, furthest



Figure 15. Continuing towards the elbow.



Figure 16. Smoothing the plaster gently.



Figure 17. Folding stockinette over plaster.



Figure 18. Moving the thumb to mould cast.



Figure 19. Fibres running obliquely.



Figure 20. Fibres straightened with a 'tuck'.



Figure 21. Bandage is back to maximal width.



Figure 22. Another tuck to straighten fibres.



Figure 23. Moulding plaster into position.



Figure 24. Achieving three-point fixation.



Figure 25. Washing plaster off your hands.



Figure 26. Smoothing the drying plaster.

from the plaster cast and on the opposite edge of the bandage, and pull them away from the roll in your hand until the fibres run transversely (Figure 20). Stretch the bandage to its maximum width and apply that edge to the forearm cast (Figure 21). The bandage will have

regained its maximal width and the transverse fibres of the bandage will once again run transversely. Repeat the process as often as necessary to ensure the bandage maintains its maximal width (Figure 22).

Tap the plaster repeatedly and gently with all your fingers, to ensure that the

plaster of Paris is distributed through the successive strands of the gauze bandaging and then mould the plaster into position while it is wet (Figure 23). 'Three-point fixation' can be achieved by applying the palm of your hand to the volar aspect of the cast. I use the 'heel' of my left thumb over the volar aspect of the patient's right wrist, with my thumb abutting onto the base of the patient's thumb (or vice versa if I'm plastering the patient's left arm). I use my other hand to mould the distal and proximal portions of the plaster to achieve three-point fixation (Figure 24).

While the plaster is drying, work on the cast to spread the plaster around equally, in all directions, using a circumferential pattern with your hands and



Figure 27. 'Rounding off' sharp points.



Figure 28. Moulding around patient's palm.



Figure 29. Moulding into patient's palm.



Figure 30. Washing plaster off patient's skin.

fingers. Just as the plaster 'firms up', wash all excess plaster from your hands or gloves (Figure 25). If bits of plaster remain on your hands when you smooth the plaster down, it will have a 'snowball' effect, causing it to gather plaster from the cast progressively, like a rolling snowball does in snow. With your hands (or gloves) wetted with water, smooth the plaster, using free circumferential movements of your hands around the plaster cast (Figure 26).

There must be sufficient free room around the patient's thumb to allow unimpeded thumb motion, and any sharp points must be 'rounded off' along the edge of the plaster cast (Figure 27). Take care to ensure that the plaster cast is appropriately moulded into the patient's palm (Figures 28 and 29).

Tricks of the trade

- Cover everything you want to protect against soiling. For example, use paper or plastic sheeting to protect the floor, the bed or couch, and the patient. Use an apron to protect your clothing and bootlets over your shoes.
- Use cold water. This will increase the setting time of the plaster and will provide more time to mould the cast, ensure an optimal position and 'work' the plaster to a smooth finish.
- Ensure all bony prominences are well padded.
- Place a bowl of water and all the required materials close at hand. The further you move soaked plaster or Paris bandages through the air, the more likely you are to make a mess.
- Keep hands or gloves clean and wet when smoothing the plaster surface. Bits of plaster that are rubbed over the cast before it sets will grow like snowballs rolling in the snow.
- Ensure that the edges of a plaster of Paris cast or slab are soft, rounded and free of any sharp points. When necessary, fragment the edges to make them soft – a Spencer–Wells forceps does the job well. If reinforcing a cast with fibreglass, remember that the edges of the fibreglass are sharp and can cut the skin – ensure that the fibreglass does not extend beyond the edges of the plaster of Paris.
- Do not dent the plaster with your fingers – the underlying pressure on the skin can cause damage.
- Ensure that a plaster of Paris cast or slab immobilises only the affected parts. Prevent the cast or slab from impairing motion of all other joints.
- Do not plaster the limb in the wrong position and then try to bend it back while the plaster is wet – this will cause creases at the bend, which can damage the skin.
- When moulding a Colles' fracture cast, do not mould the cast distally, over the metacarpal heads – a cast that is overtight at the metacarpal heads will cause the fingers to swell, leading to patient discomfort.

continued



Figure 31. Cast allows flexion of fingers.



Figure 32. Narrow between thumb and finger.



Figure 33. Cast allows thumb to oppose.



Figure 34. Cast allows normal pinch grip.



Figure 35. Cast allows normal elbow flexion.

- provide only a narrow strip of plaster cast between the thumb and index finger (Figure 32)
- provide moulding of the strip to accommodate the thumb during opposition (Figure 33)
- allow a normal pinch grip between thumb and index finger, to ensure optimal hand function during the period of immobilisation in the cast (Figure 34)
- allow normal elbow flexion – the cast should not extend so far proximally that it abuts on the antecubital fossa during flexion (Figure 35).

Once the plaster cast has 'set', wash off any plaster of Paris from the patient's skin, using a soft, wet cloth (Figure 30). Take care that no flakes fall under the cast, where they can irritate the patient's skin.

Has it been applied correctly?

A correctly applied Colles' fracture cast will:

- allow flexion of the metacarpophalangeal joints to 90° (Figure 31)

To strive for

They say that you are not really good at putting on plaster casts until you can put one on dressed in evening clothes on your way to a party, and continue unscathed! **MT**

Next month, we show how to apply a volar forearm slab.