Nursing Management of Patient with Casting

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Workshop on Trauma Management with Cast Application
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Functions

A rigid external immobilizer to secure body part

- To maintain support
- To protect realigned bone
- To promote healing & early weight bearing
- To prevent / correct deformity
Types of Cast

1. P.O.P.: CaSO$_4$.2H$_2$O
e.g. TCM, Gypsona
2. Synthetic Resin : C$_6$H$_5$.NCO
  e.g. Scotchcast, Dynacast
## Characteristics of Casts

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Plaster of Paris</th>
<th>Synthetic Resin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>heavy</td>
<td>light</td>
</tr>
<tr>
<td>Strength</td>
<td>weaker</td>
<td>stronger</td>
</tr>
<tr>
<td>Vapor Permeability</td>
<td>lower</td>
<td>higher</td>
</tr>
<tr>
<td>Moulding capacity</td>
<td>easy</td>
<td>difficult</td>
</tr>
<tr>
<td>Radiolucency</td>
<td>fair</td>
<td>good</td>
</tr>
<tr>
<td>Drying Time</td>
<td>longer</td>
<td>shorter</td>
</tr>
<tr>
<td>Price</td>
<td>lower</td>
<td>higher</td>
</tr>
</tbody>
</table>
## Price comparison

<table>
<thead>
<tr>
<th>Brand/Material</th>
<th>Unit Price Before</th>
<th>Unit Price Now</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POP bandage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10cm roll</td>
<td>$5.6</td>
<td>7.5cm roll</td>
</tr>
<tr>
<td>15cm roll</td>
<td>$7.7</td>
<td>- $4</td>
</tr>
<tr>
<td><strong>Synthetic (resin)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5cm roll</td>
<td>$32</td>
<td>5cm roll</td>
</tr>
<tr>
<td>7.5cm roll</td>
<td>$34</td>
<td>7.5cm roll</td>
</tr>
<tr>
<td>10cm roll</td>
<td>$42</td>
<td>10cm roll</td>
</tr>
</tbody>
</table>
Assessment

- History taking
  - mechanism of injury
  - medical history
  - social background
  - allergic
Physical assessment

- Neurovascular status
- Skin integrity
- Presence of wound and drainage
- Alignment and position
- Respiratory, Abdominal, Urological status
Problems Encounter by Patient with Cast
Anxiety

- Explain the purpose of immobilization and area involved
- Describe the procedure and sensation patient may experience when applying the cast
Complication of Casting

- Compartment Syndrome
- Ischemia & Neurologic injury
- Heat injury
- Pressure sore and skin breakdown
- Allergy
- Dermatitis & Infection
- Joint stiffness and muscle atrophy
Compartment Syndrome

- Increased pressure because of oedema within a closed space that compromises blood flow and tissue perfusion; this causes ischemia and reduce the capillary flow which leads to more oedema.
- A vicious cycle develops, resulting in potentially irreversible damage to the soft tissues within the space.
Compartment Syndrome

- s/s: 5 ‘P’ s
  - Pain - greater than expected
  - Pareesthesia - early sign
  - Paralysis - late sign
  - Pallor - not reliable
  - Pulselessness - not reliable

Passive stretching elicit excessive pain, a reliable early sign
Risk of Peripheral Neurovascular Dysfunction

- Causes
  - Unexpected excessive swelling
  - Cast being applied too tightly
  - Insufficient padding to allow for expected swelling
  - Local pressure on areas where the blood vessels or nerves close to the skin
Risk of Peripheral Neurovascular Dysfunction

- Elevation (at / above the heart level)
- Check tightness of the cast
- Encourage movement of the extremities
- Monitor NV status- SCMP approach
Ulnar Nerve

- Sensation: distal fat pad of the small finger
- Motion: abduct all fingers
Radial Nerve

- Sensation- web space between the thumb and index finger
- Motion- hyperextend finger or wrist
Peroneal Nerve

- Sensation- web space between the big toe and 2nd toe
- Motion- dorsiflex ankle and extend toes
Tibial Nerve

- Sensation: medial and lateral surfaces of the sole
- Motion: plantar flex ankle and flex the toes
Risk of Peripheral Neurovascular Dysfunction

- Instruct patient to report any abnormality. E.g. numbness, tingling or increased in pain
- Have cast cutter, spreader ready for use
Cast Cutter
cast + water → Gypsum + HEAT

Exothermic reaction
Factors contributing to the temperature beneath the cast materials

- Dip water temperature
- Increased thickness of casting materials
- Residue in the bucket
- Presence of insulating material over the cast-

Reports showed that dangerously high temperatures can be produced and caused burn injury when a curing cast is allowed to mature on a pillow.
Factors contributing to the temperature beneath the cast materials

- Room humidity and temperature
- Immersion time of plaster bandage
- Extra fast setting plaster achieves peak temperatures quicker and higher than slow setting plasters
Points to note

- Cautious in compromised skin
- Patients with insensitive skin e.g. comatose patients, thin skin, patients with shock
- Dip water temperature around 20°-24°C
- Fresh dip water without residue
- Plaster bandage should be dipped until air bubbles stop rising, gently squeezed to allow adequate soaking
- Avoid too thick a cast and pillow support during the setting period.
Altered Comfort: Pain

- Elevation
Altered comfort: Pain

- Check tightness of the cast
- Well padded the involved bony prominence
- Careful handling of the affected part
- Adequate analgesics
Impaired Skin Integrity

- Clean and dry the skin prior to cast
- Dress wound properly
- Ensure smooth surface
- Adequate padding
Wire impinging on Cast lead to rotation of wire
Dressing Technique

- Adequate cushion to protect skin
- Cover second layer of gauze to prevent knocking against cast
- Ensure wire is parallel to wall of cast as possible
Impaired Skin Integrity

- Ensure the edges of the cast are well padded
Impaired Skin Integrity

• Instruct patient not to place F.B into the cast
Impaired Skin Integrity

- Clean and remove excessive plaster from the skin with warm water
- Handle the cast with the palms of the hands instead of the fingers to prevent indentations in the soft plaster
- Aware of plaster sore
Plaster Sore

● Causes

● uneven bandaging technique
● Insufficient padding over bony areas
● Cast is too tight or too loose
● Foreign body inside the cast
Plaster Sore

- S/S
  - itching
  - burning sensation
  - fever
  - sleep disturbance
  - foul smell
  - discharge
Cast indentation constriction
Keeping sliding

Compression

Sore inside
Impaired skin integrity
● Window piece should put back after inspection
Impaired Mobility

- Exercise joints above and below the affected limb to prevent stiffness of the joints
- Perform muscle strengthening exercises
Impaired Mobility

- Encourage self-help. Provide appropriate mobilization aids
- Assist in reposition of patient
- Chronic Pain Syndrome
- Adopt fall prevention measures
Impaired mobility

- Weight bearing is not allowed until cast is dry/instructed by surgeon
Impaired mobility

- Cast Boot
- Walking Heel
Risk of Loss of Alignment

- Maintain the reduction and keep the affected part in a desired position during cast application
- Promote drying of the unconsolidated cast
- Use pillow to support the cast
Risk of Loss of Alignment

- Support the cast with palms
- Check for cracks/softening/loosening
Allergic Reaction

- Check for allergy history before apply cast
- excessive irritation → remove the cast, cleanse the skin thoroughly and re-apply other materials.
Body Image Disturbance

- Allow to choose the preferable colour, esp. in adolescence
- Discuss expectation of activity and appearance of cast
Knowledge Deficit

- Assess concern and knowledge of POP care
- Provide education and pamphlet in care of POP cast and discuss in adaptation of daily activities
Patient Education

- Stay in a well-ventilated environment to promote drying up of the cast.
- Keep the cast away from heat.
- Never put the cast on hard surface.
- Elevate your limb at heart level to help reduce pain and swelling. Support the arm with arm sling and use pillows to elevate the lower limb.
Patient education

- Move your fingers and toes frequently to prevent swelling and joint stiffness.

- Avoid bumping or knocking your cast against hard surfaces.

- Do not walk on a "walking cast" until it is completely dry and hard, and instructed by doctor.
Patient Education

- Do not push anything down the plaster.
- Do not use device (e.g. stick) to scratch underneath the cast. If itching persists, contact your doctor.
- Keep the cast dry and prevent it from getting wet.
Patient education

- To avoid getting your cast wet when taking a shower, **cover it with a plastic bag** and secure the bag to your skin with waterproof tape, making sure that it does not allow water to leak in.
Patient Education

- Report immediately if
  - there is any pain, offensive smell or discharge from the plaster
  - the fingers or toes become blue, swollen or tingling sensation
  - any hard objects drop into the plaster
  - the plaster become too tight, loose, soft or cracked
  - the child become irritable and is crying with no obvious reason
Advice on Diet

- Calcium and vitamin C aid in bone healing.
- A balanced diet: milk product, fish, fruit, vegetables

No smoking!!
Care After Cast Removal

- The skin may become dry and scaly
- Wash skin with mild soap and water daily and use moisturizing lotion helps the dead skin to slough off and soften the new skin
- Inform patient that it is expected the affected limb will be smaller than other limb. Once patient start to use the muscle again, the muscles will build back up.
- It is normal to have some joint stiffness following cast removal. The joint stiffness is caused by lack of motion of the joint while in the cast. It will improve with time.
Thank You