Orthotic Management of Brachial Plexus Injury

Brachial Plexus Study Day
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Outline

• Orthotics
• Functional loss and orthotic aims in BPI
• Prescription considerations
• Prescription options
• Use of pre-preg. carbon fibre

Orthosis: definition

"an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system” (ISO, 1989)
Functional losses in BPI

- Loss of motor control
- Loss of sensation
- Pain (mechanical or nerve pain)
- Poor body image

Presentation

Orthotic Aims in Brachial Plexus

- Prevent shoulder joint pain
- Prevent contractures
- Improve function e.g. enable positioning of hand in space to allow two handed activities
- Improve cosmesis & body image
Prescription Considerations

- Prescription should be made based on functional loss
- Custom-made or pre-fabricated
- Motor function
  - Shoulder
  - Elbow
  - Wrist and hand
- Cosmetic appearance
- Patient aims and expectations

Orthotic options

- Sling
- Humeral cuff
- Wilmer shoulder orthosis
- Wilmer elbow orthosis
- Steeper Stanmore flail arm orthosis- custom made or kit
- Humeral Cuff combined with customised elbow orthosis

Sling

- Reduces shoulder subluxation and pain
- Elbow maintained in flexed position – risk of contractures
- Neck pain may be a problem
Humeral Cuff

- Many “off the shelf” designs available
- Prevents shoulder subluxation, and pain
- Does not control elbow or hand

Wilmer shoulder orthosis

- Down-strap acts as a fulcrum: weight of forearm pushes humerus upwards into shoulder joint
- Quick and easy to fit
- Not possible for patient to move elbow joint

Wilmer elbow orthosis

- May need gleno-humeral arthrodesis as shoulder is not supported
- Medial locking steel with 2 fixed positions of flexion
Stanmore flail arm Orthosis

- Provided by RSL Steeper – kit
  Weight of arm taken onto shoulder yoke via universal type shoulder joint
- Locking elbow joint
- Can be improved by using custom made shoulder and forearm sections

Fishing Appliance

Pre-preg. carbon fibre
Carbon Fibre is pre-impregnated with an epoxy resin
Use of Pre-preg. Carbon Fibre

**Advantages:**
- Very light weight
- Thinner than conventional design
- Improved cosmesis

**Disadvantages**
- No adjustability after final fit
- Time consuming to manufacture

Humeral cuff and customised Elbow Orthosis

Instructions and review

- Donning and doffing orthosis
- Need to check skin frequently
- Wearing–in schedule
- Cleaning the orthosis
- Do not carry out own adjustments / repairs
- 1 month review
Conclusion

• Small number of patients
• Team approach essential
• Timing of orthotic intervention
• Establish goals of patient
• Use of customised devices for longer term use

Any Questions?

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