Physiotherapy for the hip disarticulation amputee

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Plan

• Pre-amputation Consultation

• Pre-prosthetic Physiotherapy
  – Exercises
  – Functional Mobility

• Prosthetic Physiotherapy
  – Initial gait training
  – Functional activities

• Case studies x 2
Challenges: hip disarticulation

- No residual limb for prosthetic control
- Double pendulum
- No early walking aid
- Mobility is slow
- Function is difficult
- Energy consumption is high (100 - 200%)
Case Review 1

- 17 year old male
- Right hip disarticulation 14.7.87 for osteosarcoma right femur
- Diagnosed April, chemo x 3, amputation a/a, post op chemo (refused last dose)
- Redundant apprentice electrician.
- Very active – acting, playing in band
Case review 1

- Film 1: 8.9.87 (7 weeks post op)
- Film 2: July 1989 (2 years post op)
Pre-amputation

Assess

• Spine strength and ROM
• Existing postural adaptations
• Postural awareness
• Ability to dissociate pelvic movement in standing
• Upper limb and remaining limb strength and ROM

Advice

• Functional mobility with elbow crutches/wheelchair
Exercises

- Hip hitching // quadratus lumborum stretch
- Posterior pelvic tilt & abdominal strengthening // lumbar extension
- Bridging
- Anterior pelvic rotation // posterior pelvic rotation
- Remaining limb: glut max and med strength, inner range quads
Post-amputation: pre-prosthetic

- Postural correction: sitting and standing
- Exercises as above
- Core stability training
- Lying on amputated side
- Balance
- Seating assessment
SITTING POSTURE
Prosthetic

- Don and doff
- Socket fit and wear time
- Sit to stand
- Stand to sit
- Posture correction
Monocentric (flex/ext), ext assist and stop eg 7E7 used with polycentric mechanical knee

Monocentric (flex/ext) with hydraulic stance and swing control eg 7E9 used with polycentric mechanical knees and microprocessor knees

Polycentric with hydraulic stance and swing control, 3D movement (flex/ext/rot) eg helix used with C leg or Genium
Sitting down

Single axis hip with polycentric mechanical knee

Polycentric hip with single axis knee
Gait re-education: single axis hip and mechanical knee

- Weight transference: side to side
- Stepping with intact
- Weight transference: forward and back
- Bending prosthetic knee
- Stepping with prosthesis
- Walking
- Turning
Gait Training
Prosthetic stance
Weight transference
Progress to ‘stork walking’
Stepping with prosthesis
Gait re-education: 3D hydraulic hip and microprocessor knee

As above but less

• Pelvic tilt
• Hip hitching
• Feel initiation swing flexion
• Resisted walking **ant pelvic rotation
Vaulting

Preswing

Initial swing

Midswing

Contralateral limb
Circumduction
Stairs and slopes

• Mechanical knee
  – Stairs: one step at a time
  – Slope step to

• Microprocessor knee
  – Stairs
    • Ascending: one step at a time
    • Descending: foot over foot
  – Slope: foot over foot
Case review 2

- 38 year old social worker
- Right hip disarticulation amputation for congenital abnormality
- Limited walking distance (0.5 Km, no hills)
- Low back pain (VAS 7/10)
- Socket soreness (SCS 3-4/10)
- Scared of falling: ABCS 46%
- Fatigue

**Intervention**
Helix hip and C leg 3
Physiotherapy Session x 19
Case review 2
Long term HD transition from mechanical to helix hip and C leg

Feb 2015
Case review 2
Change from mechanical knee to C leg and Helix hip

June 2015
Case review 2: outcomes

- Increased outside walking distance 1.1 Km (1.6Km)
- Increased walking speed (58m more in 2minTWT)
- No low back pain (VAS 0/10)
- Less socket soreness (SCS 6/10)
- More confident: ABCS 95%
- More active
- Loading symmetry 9.8 (before 18.6)
Take Home

- Know your prosthetic components
- Strong, flexible and stable trunk and remaining limb
- Swing: posterior pelvic tilt & hip hitch or load toe and rotate
- Stairs and slopes: step to or step past

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