Rapid Cycle Improvement Change after a Case of Retained Negative Pressure Wound Therapy Sponge

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Introduction

• 16 yo male sustained a 35cm x 35cm Morel-Lavallee avulsion injury to back & bilateral buttocks.
• Negative pressure wound therapy (NPWT) was placed for wound management.
• Wound healing failed to progress & patient complained of pain. CT imaging revealed retained NPWT sponge.
• Risk factors that led to retained sponge:
  - Wound was contiguous with two entry points (back & trochanter)
  - Multiple sponges used
  - Multiple providers involved
  - Frequent dressing changes
  - Lack of written handoff communication regarding sponge insertion & removal
  - Our work identified a process to prevent future retained NPWT sponges.

Objectives

• Describe rapid cycle improvement change.
• Describe interventions to prevent against NPWT sponge retention.
• Identify how the complexity of a Morel-Lavallee wound care placed the patient at risk for retained NPWT sponge.

Rapid Cycle Improvement Change Process

• The Plan-Do-Study-Act (PDSA) cycle is a tool from the Institute for Healthcare Improvement Model for Quality Improvement for small scale tests of change.
• PDSA – Plan the change, Do the change, Study & observe the results, & Act on what is learned.
• Cycle is repeated until change is successful.
• Used for action-oriented learning.

Negative Pressure Wound Therapy

• NPWT – modality to manage complex wounds.
  - A system using sponges & transparent film to provide an airtight wound environment.
  - A variety of sponges are placed; with each dressing change are removed & replaced.
  - Our patient had multiple dressing changes – using multiple sponges due to size of the wound.

Morel-Lavallee Avulsion Injury

• Morel-Lavallee injury – occurs from high impact trauma.
  - Mobile skin & subcutaneous fat shear off of immobile fascia during impact
  - Leads to a hollow space which fills with hemolymphatic fluids
  - Diagnosed by physical exam & imaging
  - MRI is most sensitive
  - Symptoms usually identified early but 1/3 of cases can have late presentation (as late as 18 months post-injury)
• Treatment: compression, percutaneous drainage, serial operative debridement, NPWT

Results

• Change has been sustained as demonstrated by documentation of sponge count on insertion and removal in Op Notes & LDA.
• No retained sponges / further cases.

Conclusions / Implications

• Rapid cycle change (PDSA) is an effective model to identify gaps and address systems issues that can lead to adverse outcomes.
• The major identified gap for this case was the ineffective use of verbal communication for handoff with NWPT dressing changes.
• We developed a safer practice for NPWT dressing change when multiple sponges are used.

References