Perioperative Evaluation and Postoperative Complications in Pediatric Dermatologic Surgery

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Objectives

• Review perioperative approach to procedures
• Discuss the evaluation, diagnosis, and management:
  ✓ Pain
  ✓ Infection
  ✓ Suture reactions
  ✓ Wound dehiscence
  ✓ (Bleeding)

• Not going to talk about scars, specific laser complications, risks of general anesthesia, and wound care
General approach to procedures in children (preop)

• Sit at or below level of the child
• Include the child in the conversation
• Explain what will happen in an unthreatening manner
  – Avoid words like “cut”, “shot”
  – Describe what it will feel like in understandable terms
  – DO NOT LIE
• Cover surgical trays
• Positioning is key (toddler wrap/swaddle)
Myths about pain in infants and children

- *Children and infants do not feel pain*
- *Pain is not remembered*
- *Unable to tell “where does it hurt?”*
- *Don’t tell the truth about pain*
- *Children tolerate pain better than adults*
Peroperative evaluation: pain

- What is expected intensity and duration?
- Consider context, coping style and temperament of child (and family support)
- Child’s history of pain?

*Inadequate pain control = negative impact/implications*

- Long-term consequences regarding reaction to later painful stimuli
- Acceptance of subsequent health care interventions
Perioperative evaluation: pain

• Key to management is *anticipation*!
  – Anticipate need for distractions, pre-op analgesia, pain medication

• Certain procedures may be more painful
  – Nail procedures, ablative laser and large excisions with extensive undermining may hurt more

• Consider age, context, coping style and temperament of child (and family support), history of pain

*Inadequate pain control = negative impact/implications*
Perioperative pain: approach

• Goal: provide comfort, minimize pain/anxiety

• Utilize parental involvement, office staff

• “Child Life” or child advocates

• Assessment of pain is critical
  – Utilize pain scales (based on age), *ask the child*
  – Keep in mind age and any developmental delay/special needs
Pain scales based on age

• Neonates to < 3 years
  – CRIES scale
  – Neonatal Infant Pain scale (NIPS)
  – FLACC (2 mo-7 years)

• Children > 3 years (self report)
  – Wong-Baker Faces Scale and pictorial scales (ages 3-7 years)
  – Visual Analog Scale (numbers) for ages 8+ years

http://wongbakerfaces.org
Pain/anxiety management

BEFORE THE PROCEDURE

- Ice packs
- Topical anesthetics (EMLA/LMX)
- Breathing techniques
  - Pin wheel, bubbles, diaphragmatic breathing
- Distractions-iPad, books
- Preoperative midazolam (OR)
- Oral sucrose solution in infants
- Ethylene chloride spray

Pain/anxiety management

**DURING THE PROCEDURE**

- Vibration, tapping, Buzzy bee
- *Breathing techniques*
- *Distractions-iPad, books, singing*
- Buffered lidocaine (room temp)
- Inject slowly
- Inject deep first, 30G needle
- Bupivacaine at end of procedure (OR)

*Burk C et al. Pediatr Dermatol 2007*
Post-procedure tips

• Praise no matter what (awake)

• Don’t apologize

• Positive incentive techniques (small prize)

• Fun, colorful dressing

• ”Doctoring” on stuffed animals (OR)
Post-op pharmacologic pain management

• Acetaminophen and NSAIDs (ibuprofen) are 1st line
  – Mild to moderate pain, limits need for opioids
  – Work great in alternating combination
  – Ensure parents know weight based dosing, frequency
  – Few side effects; no increase bleeding in pediatric surgery studies

• Opioid analgesics-seldom needed
  – Moderate to severe pain, breakthrough pain
  – Often used in combination with NSAIDs
  – FDA black box warning for codeine
  – Watch for interactions with other meds, side effects
Post-op pain PREVENTION

• Limit activity--biggest factor!

• Elevation for extremity wounds, ice packs

• Use appropriate wound dressings (bulky, compression)

• Prepare ahead for pain with analgesics strategy before onset
  – Acetaminophen and NSAIDs (ibuprofen) at home
Surgical site infections

- Uncommon in pediatric skin surgery (class I/II)
- Usually presents post-op days 4-10
- Purulent drainage, *pain*, redness, heat, swelling, & isolation of an organism
- Causes:
  - Presence of bacteria on skin, mucosa (class III/IV)
  - Improper wound care (hygiene, soiled dressings)
Surgical site infection rates in children

- **Pediatric general surgery**: 2.5%-5.4%*  
  - Amount of contamination at operation, duration of operation

- **Spain (derm service)**^: 210 procedures/190 children, over 6 y  
  - Surgical complications 22.6% of cases (? Stats)  
    - Scar stretching, keloids, HT scar, infection (Abx in 4 patients)

- **Boston (plastics)**&: 872 excisions, 700 patients, over 4 y  
  - 0.3% (3) infections in series, 68% done in OR setting

*Bhattacharyyan N 1990; Davis SD 1984; Horwitz JR 1998; Sharma LK 1986.  
Surgical site infection rates in kids

• Adult derm surgery: LOW <1% to 2.3%*

• Children likely the same as adults

• No adequate data on primary skin procedures in children performed by dermatologists/peds derms

• Similar to adults, no preoperative antibiotics for clean/non-contamination skin lesions^  
— Inquire about children with cardiac conditions, joint prosthesis

*Futoryan T 1995; Dixon AJ 2006; Maragh SL 2008; Cook JL 2003; Kulichova D 2013  
Risk factors for surgical site infections

• Not well-defined in pediatric dermatologic surgery

• Known risk factors for adult dermatologic surgery

• Potential risk factors:
  – Surgery in diaper area/groin; feet
  – Preoperative hair removal via shaving ➔ trim with scissors
  – *Likely:* poor nutritional status, immunodeficiency, immunosuppression, poor wound healing history
Post-op surgical site infections: management

- Know difference between normal healing wound
- Identify early and perform a wound culture
- Know local resistance patterns, patient’s history
- Treatment based on culture and sensitivities
- Severe infections (necrosis, fluctuance, dehiscence)
  - consider partial/complete suture removal, leave wound open to drain, heal by secondary intention
Post-op surgical site infections: management

• May want to start empiric antibiotic coverage while waiting for culture (cephalosporins)

• Worsening despite antibiotics=consider MRSA

• Severe infections (necrosis, fluctuance, dehiscence)
  – consider partial/complete suture removal, leave wound open to drain, heal by secondary intention
Preventing post-op infections

• Consider timing of surgery on high-risk sites

• Perioperative counseling to restrict excessive activity to prevent trauma, bleeding, dehiscence (usually wait 3-4 weeks)

• Use of a bulky dressing in the immediate post-op period

• Limit dressing changes in clean areas, more frequent in dirty ones

• Explicit wound care instructions; counsel on signs of infection
  – Verbal, written, nurse calls, office visit for wound check
Suture reactions

- Incidence unknown in children
- 6 weeks post-op onset (1-4 months)
- *Excessive reactions* increase risk of dehiscence, infection, delayed wound healing
- Examples: pustules/suture abscesses, suture extrusion, granulomas
- More in late childhood and early adolescence?
Preoperative planning: suture selection

- Small caliber, monofilament >> large caliber, multifilament
- Synthetic >> natural materials (silk, surgical gut)
- Non-absorbable >> absorbable
- Poliglecaprone, Polyglactin 910, Polypropylene

Choose suture wisely=less reactive is better
Intraoperative: minimizing suture reactions

• Used smallest caliber suture appropriate
• Avoid buried sutures to close to surface
• Smaller caliber suture at ends of excision with less tension
• Keep knots small and flat (fewer throws) at the apices of excision
Management of suture reactions

• **Identify** and don’t confuse for infection
  – Erythema and edema along length of suture line
  – With time, pustules, red papules
  – Visualization of extruding suture with erythema/purulence
  – “Spitting suture” with sinus tract
  – Mild-moderate tenderness when palpated
Management of suture reactions

• Reassurance!

• Often healing and scar formation not impeded

• Remove offending suture material when possible
  – Utilize sterile forceps, sterile needle to open pustules
  – Inspection/gentle pressure
  – Massage at home, warm compresses
  – Punch biopsy tool for deeper, bigger lesions
Wound dehiscence

- Incidence in children unknown, *can be problematic!*
  - Likely greater due to increased activity level
- Can occur at any time post-op
- Causes:
  - #1 cause is surgical wound infection
  - *Excessive post-operative activity*
  - Improper wound apposition
  - Tissue necrosis/extensive tension on wound edges
  - Premature suture removal
Dehiscence management

• Identify and treat wound infections, bleeding/hematoma

• 1\textsuperscript{st} 24 hours (clean) wound may be re-sutured if deep sutures are intact and no tension

• Later (clean) wounds may heal by secondary intention, esp if under high tension/necrosis

• Try to leave necrotic wounds alone
Dehiscence and prevention

• Limit tension on wound and wound edges
  – Utilize undermining and appropriate wound edge approximation
  – Special suture techniques
  – “Oversew” (increase deep sutures) near joints and high tension areas
  – Place few non-absorbable deep sutures

• Proper suture choice and placement (running subcuticular)

• Strict limitations on post-operative activity

• Ideal timing of suture removal
Bleeding: preoperative

• Early complication, uncommon in pediatrics

• Assess history of bleeding in low-risk procedures
  – Coagulopathy/hemophilia

• Ask about anticoagulopathy therapies

• Review all medications (herbal, OTC and RX)
  – NSAIDs do not significantly increase risk

• Discuss post-op activity limitations, wound care EARLY
Bleeding: intraoperative

• Scalp and extremity surgery biggest culprit
• Careful control of bleeding during procedure
• Ensure adequate hemostasis before closure
• Utilize pressure dressings
Bleeding: post-operative

• Acute bleeding:
  – Immediate trauma to site
  – Rebound vasodilation after epinephrine wears off

• Timely diagnosis and intervention critical

• Cold pack, elevation, rest, reduce blood flow

• Active bleeding: pressure and clean dressing

• Continued bleeding: urgent evaluation
Bleeding and hematoma: management

• Timely diagnosis and intervention critical

• Cold pack, elevation, rest, reduce blood flow

• Active bleeding: pressure and clean dressing

• Continued bleeding: urgent evaluation
  – May need suture ligation, electrocautery

• Hematoma: depends on stage, size, symptoms and risk to tissues
Conclusions:

• True complications in pediatric derm surgery aren’t frequent

• Appropriate and thorough perioperative evaluation and planning may limit complications and may lead to happier patients

• More data is needed in procedural pediatric dermatology

• Always be critical of your work
  • “If you are not asking yourself what could I have done better, you are probably not doing a good job”
THANK YOU!

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