Tips for Tots: Eye Injuries

by Charles Hall | October 5, 2015

Introduction

Some of the most stressful situations encountered in an emergency department have to do with kids. Even the most benign pathologies can become high anxiety encounters and if you throw in a stressed out parent who provides the added benefit of sideline quarterback then you’ve got a real mess on your hands.

There are a plethora of review articles that look into the management of pediatric pain and anxiety with a multitude of options to choose from [1]. Learning how to deal with these stressful scenarios quickly and efficiently and with the patient’s comfort and best interest in mind can work wonders.

Ocular injuries are a common complaint and are seen often in the ED. These types of injuries can be a significant source for pain and stress, especially in children. The importance of a good examination and prompt management are paramount. Here we will talk about a few tricks that, although simple and seemingly intuitive, can help us to examine, diagnose, and treat pediatric ocular injuries in children both efficiently and effectively.

Specifically, we will address chemical eye injuries as these situations are time sensitive, require prolonged management times, and thorough ocular exam, and are sources for significant pain and stress to the patient.

Case

Two and half year-old male presents with parents for sudden onset of pain in the R eye after playing in the basement with his twin brother approximately 20 minutes ago. Dad heard crying from downstairs and found his son holding an open bottle of bleach in the laundry room. The child was holding his right eye and seemed to be in excruciating pain.

Dad attempted to wash patients eyes in the sink but could not get his child to open his eyes so they rushed to the nearest ED. Patient is otherwise healthy with no PMHx or SurgHx and vitals signs are stable except for tachycardia.

Upon entering the room you are immediately confronted by the parents. “Please do something NOW! I think he is going blind!”

First things first… get things moving. The patient needs copious irrigation but not without first receiving adequate pain control and anxiolysis and eventually the patient will need a proper ocular examination.

Intranasal Versed or Fentanyl

Quick, non-invasive, effective. Take into account the clinical context and choose accordingly. These drugs differ in respect to onset and duration and using them in combination increases the risk for over-sedation. That being said, these are some great options in kids for stress reduction and pain control. Studies have shown that early pain experiences may play an important role in shaping an individual’s pain responses going forward so it is important to provide adequate analgesia [2] and to reduce stress.

Intranasal versed is dosed at 0.3 to 0.5 mg/kg and studies have shown benefits in the areas of stress and anxiety reduction with simple procedures in the ED [3]. It may also provide amnesia to the encounter itself. It has a
rapid onset and is generally considered safe in regards to respiratory depression.

Intranasal fentanyl works great for pain control in patients over 3 years of age (it has not been tested in younger patients) and has been shown to be as effective as IV morphine for pain control [4]. Starting dose is 1.5 mcg/kg with the option to repeat dosing in 15 minutes at 0.5-1.5 mcg/kg. Always check for signs of respiratory depression and treat accordingly as pediatric patients are more susceptible to opiates.

Create a “Cape” (aka papoose)

Supplies:

1. Pillow case
2. Shears
3. Sharpie

This is a personal favorite. Who doesn’t love a super hero? Even if the child’s pain and anxiety are under control, there may still be a need for light restraint and a pillowcase makes for an ideal, non-threatening option. You can even draw the child’s superhero logo of choice for added diversion and compliance (might have to work on those art skills, however)

- Take the pillow case off of the pillow in the room
- Using trauma sheers, cut a hole slightly larger than the size of the patient’s head
- Place the “cape” over the child’s head and ensure that their arms are at their side
- You can allow the lower arms to protrude from beneath the open end of the pillowcase but tighten it enough to keep patient’s upper arms at their side
- Parent’s can help with this… it gives them something to do and brings them to the child’s side for comfort.
- Essentially, you have a created a more “fun” papoose than the tradition bed sheet
- As an added bonus you can cut a half circle out of the side of traditional basin and line the cut edge with a towel. The child may then place their head in the basin to catch the runoff from the irrigation.

**Irrigation**

Supplies:

1. Proparacaine (0.5%)
2. 1L NS
3. IV tubing
4. Pressure bag
5. Tape
6. Shears

Now that the child is a little more comfortable, get the irrigation going. Proparacaine may or may not be necessary at this point depending if you have adequate pain control. 2 drops on the medial canthus should
prompt some blinking to properly coat the eye.

- Obtain 1L bag of NS and pop in some IV tubing
- Place the saline in a pressurized bag
- Cut the distal portion of the tubing so that you essentially have it running unimpeded through the tubing
- Place the end of the tubing that it rests just above the medial canthus of the affected eye and allow the fluid to run over the eyeball and off into a basin (you can even tape the tubing just above the eyebrow)
- Use as much saline as is necessary to achieve optimal pH
- Child may keep eye shut tight so it may be necessary to get some additional hands to separate the eyelids (hopefully the patient is relaxed at this point, however)

**Distraction**

The art of distraction is an important tool to have when dealing with children and studies show that it may significantly reduce behavior stress during procedural distress [5]. So don’t be afraid to get out your smartphone. There are some great apps out there for distracting children in the ED. The “candlelight” apps are simple to use and great for infants and toddlers. Oftentimes kids will follow the light with their eyes and head which allows for a decent neuro-ocular examination, not to mention assessment of nuchal rigidity in other clinical scenarios.

**Assess the pH**

Checking the pH shouldn’t be a difficult task using this set up. Since normal saline solution is running across the eye medial to lateral, simply place the pH paper adjacent to the lateral canthus and this will give you the pH of the eye. Once the pH drops to a normal range, the saline irrigation may be stopped. Even though many solvents penetrate the eye only to a limited extent and may not require 30 minutes of irrigation, ophthalmologists generally recommend continuous irrigation until a neutral pH is achieved. A normal eye pH is generally between 6.5 and 7.5 depending on the method used. It is recommended to check the pH level of the unaffected eye to determine what is normal [6].

**Fluorescein stain and blacklight examination**

As you are preparing to stop irrigating the eye, be sure to get set up for your eye examination. In addition to these simple and handy ways of introducing fluorescein stain (http://bit.ly/1IKYM4g) it is also possible to simply place the fluorescein paper directly into the stream of the irrigation and the dye will be transmitted to the eye seamlessly. From there, use a hand held blacklight so that the patient doesn’t require any changes in position and inspect the eye for any corneal abrasions or burns.

**References**

1. Relief of Pain and Anxiety in Pediatric Patients in Emergency Medical Systems


emergency medicine, 49(3), 335-340.


Thanks to my son, Miles Hall, for being the best baby model there is!

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