Pediatric Ovarian Torsion

Brendan Campbell, MD, MPH
Samantha Pelow, APRN
Jennifer D’Amato, RN, BSN, MSHI
What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.
Objectives of the Pathway

Implement a systematic approach to manage patients presenting with ovarian torsion

Achieve prompt recognition and rapid definitive surgical treatment for patients with this condition

Outline consistent discharge criteria and ensure appropriate outpatient follow-up for patients with ovarian torsion
Ovarian torsion is the complete or partial rotation of the ovary on its pedicle, leading to ischemia and potential loss of the ovary.

Why is the pathway necessary?

A dusky torsed ovary
Early diagnosis can be challenging as ovarian torsion accounts for only 3% of acute abdominal pain in females, and can mimic other more common conditions. While Doppler ultrasound is an important part of the initial workup, normal ovarian appearance and Doppler flow do not exclude the possibility of torsion. Prompt surgical treatment with operative de-torsion is the key factor leading to ovarian salvage.

Why is the pathway necessary?
Age Distribution of Ovarian Torsion

The diagram shows the number of patients with ovarian torsion across different age groups. The x-axis represents age in years, ranging from 0 to 17, and the y-axis represents the number of patients, ranging from 0 to 160. The peak occurrence of ovarian torsion is around the age of 11 to 12 years.
This is the Ovarian Torsion Clinical Pathway. We will be reviewing each component in the following slides.
Any female patient 2 years or older who presents with clinical features concerning for Ovarian Torsion, should have a STAT pelvic ultrasound with Doppler.

**Typical Clinical Features:**
- Female w/sudden onset lower abdominal pain
- Crampy, usually unilateral
- Often nausea/vomiting
- Lower abdominal tenderness

**Inclusion Criteria:** ≥ 2 yr old, female with suspected ovarian torsion based on history and physical

**Exclusion Criteria:** <2 yr old, male, no suspicion of ovarian torsion based on history and physical

**Flowchart:**
- STAT pelvic ultrasound with doppler
- Consult Pediatric Surgery
- Obtain labs (complete blood count, electrolytes, liver function) and consult pediatric surgery
- Operative Treatment
  - Left side
  - Ovarian preservation if feasible
  - Unilateral oophorectomy

**Outpatient Pain Control:**
- Tapered oral ketorolac (max 30 mg/day or IV 30 mg IV q4h max 120 mg/day)
- Morphine SL 4 mg q4-6h max 24 mg/day
- Pain control per obstetrician

**Discharge Criteria:**
- Tolerating diet, pain controlled with PO pain medications, no fevers, adequate urine output

**Contacts:**
- Brendan Campbell, MD
- Samantha Pelow, APRN
- Jennifer D'Amato, RN

©2019 Connecticut Children's Medical Center. All rights reserved.
If the Pelvic Ultrasound is positive for one or more radiographic feature, then proceed down the pathway and prepare the patient for surgery. Consult Pediatric Surgery
Make patient NPO
Send STAT serum tumor markers

Note that no antibiotics are necessary

Abnormal Ultrasound? (≥ 1 feature present)
- Enlarged heterogeneous ovary compared to opposite side
- Abnormal ovarian location (midline or change from prior)
- Ovarian mass or Adnexal mass
- Ovarian cyst >5cm
- Absent or decreased ovarian blood flow (venous or arterial)
  *presence of vascular flow to ovary does not exclude ovarian torsion*

Yes

- Consult Pediatric Surgery
- Make NPO and start MIVF
- Send serum tumor markers (α fetoprotein and β hCG [quant]; additional tumor markers at the discretion of the attending surgeon
- Clean case (antibiotics not indicated)
The operative goal is ovarian preservation whenever possible.

Certain factors that may lead to unilateral oophorectomy are:
- Large masses (over 10 cm)
- Abnormal tumor markers
- And/or
- Solid or non-cystic masses

See the algorithm for Operative management on the next slide.
Algorithm for Operative Management

1. Suspected Ovarian Torsion
2. Pelvic Ultrasound
3. Blood flow to ovaries?
   - No: Stat Serum β-hCG & AFP
   - Yes: Consider alternative diagnoses
4. Operative Treatment
5. Ovary/mass <10 cm, normal tumor markers, and predominantly cystic ovarian lesion?
   - No: Unilateral Oophorectomy (consider ovarian conservation for benign masses)
   - Yes: Ovarian Preservation
     - Cystectomy
     - Partial Oophorectomy
Torsed Ovary

Fluid filled cystic mass. Note the dusky color.

Note the twisting
Ovarian Preservation

Mass removed, and healthy ovarian tissue remaining.
Post operative management starts with pain control.

Once pain is well controlled and patient is tolerating a regular diet, switch over from IV to PO pain medications.

No narcotics required at discharge.

Follow up is in 4-8 weeks in the surgery clinic. The need for repeat pelvic ultrasound is determined on a case by case basis.

---

**Post-Op Pain Control:**

**Initial pain control:**
- Toradol 0.5 mg/kg/dose (max 30 mg/dose) IV q6hr x48hr
- Acetaminophen 15 mg/kg q6hr PO/PR ATC (max 1000 mg/dose; max 75 mg/kg/day, not to exceed 1000 mg/day)
- Morphine 0.1 mg/kg/dose (max 5mg/dose) IV q3hr PRN pain

**Once pain well controlled:**
- Acetaminophen 15 mg/kg/dose (max 650 mg/dose) PO q4h ATC
- Change toradol to Ibuprofen 10 mg/kg/dose (max 600 mg/dose) PO q6hr ATC
- Change morphine to Oxycodone 0.1 mg/kg/dose (max 5 mg/dose) PO q4h PRN

**Nutrition:**
- Clears, advance to regular diet as tolerated

---

**Discharge Criteria:**
Tolerating diet, pain controlled with PO pain medications, no fevers, adequate urine output

**Discharge Medication and Instructions:**
- Ibuprofen 10 mg/kg (max 600 mg/dose) PO q6hr PRN
- Acetaminophen 15 mg/kg (max 650 mg/dose) PO q6hr PRN
- Follow up 4-8 weeks with Pediatric Surgery
- Repeat pelvic ultrasound at the discretion of the attending Pediatric Surgeon
Quality Metrics

Average time from arrival to start of imaging (pelvic ultrasound with Doppler)
Average time from imaging to start of definitive operative management
Percentage of patients with ovarian preservation
Pathway Contacts

Brendan Campbell, MD, MPH
Department of Pediatric Surgery and Trauma

Samantha Pelow, APRN
Department of Pediatric Surgery and Trauma

Jennifer D’Amato, RN, BSN, MSHI
Program Manager Children’s Surgery Verification


About Connecticut Children’s Clinical Pathways Program

The Clinical Pathways Program at Connecticut Children’s aims to improve the quality of care our patients receive, across both ambulatory and acute care settings. We have implemented a standardized process of clinical pathway development and maintenance to ensure meaningful improvements to patient care as well as systematic continual improvement. Development of a clinical pathway includes a multidisciplinary team, which may include doctors, advanced practitioners, nurses, pharmacists, other specialists, and even patients/families. Each clinical pathway has a flow algorithm, an educational module for end-user education, associated order set(s) in the electronic medical record, and quality metrics that are evaluated regularly to measure the pathway’s effectiveness. Additionally, clinical pathways are reviewed annually and updated to ensure alignment with the most up to date evidence. These pathways serve as a guide for providers and do not replace clinical judgment.