Ovarian Torsion

Urgent Care & Emergency Department

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Inclusion criteria

Natal female with sudden onset lower abdominal pain

[Signs and Symptoms]

Sudden-onset, lower abdominal pain, particularly when associated with nausea and vomiting

Alert

If high clinical suspicion of torsion is present, consult GYN STAT and ensure prompt imaging is obtained

Concern for Ovarian Torsion

If in Urgent Care, rapid transfer to MCED

[Diagnosis & Definition]

[Differential Diagnosis]

NPO

Bladder full per patient report?

No or unsure → **Foley catheter to fill bladder**
Obtain urine βHCG

Yes

Pelvic ultrasound (US) with doppler

Obtain urine βHCG with post-ultrasound void if patient ≥12 years of age or post-menarchal (if not already obtained)

Yes

High clinical suspicion of torsion
or
Imaging suggestive of ovarian torsion?

Yes → **STAT GYN Consult**

No → **Imaging suggests ovarian mass?**

No → **Off Pathway**
Consider Differential Diagnosis

Yes → [Ovarian Mass Algorithm]

GYN to book semi-emergent laparoscopy

Goal: < 2 hours from decision to time of incision

Ovarian Mass

Emergency Department/ Inpatient

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ED Algorithm

Patient with Ovarian Mass

Consult Gynecology

Clinical/radiologic Suspicion of Ovarian Torsion

- Book semi-emergent diagnostic laparoscopy
- Detorsion +/- Ovarian-Sparing Surgery if possible
- Order Ovarian tumor markers if imaging or surgical findings concerning**

Tumor markers obtained and elevated?

- Yes → Multidisciplinary discussion with subsequent operative intervention
- No → Detorsion surgery only?

Detorsion surgery only?

- No → Tissue obtained?
  - Yes → Pathology benign?
    - Yes → F/U in GYN/Ped Surg clinic in 4-6 weeks Resolved unless symptomatic No further imaging indicated
    - No → Multidisciplinary discussion of further staging
  - No → F/U in GYN/Ped Surg Clinic in 4-6 weeks
- Yes → F/U w/Repeat U/S in 4-6 weeks if mass present or ovary enlarged → Return to Simple Cyst or Complex Mass arm of pathway if indicated

Simple Cyst

<8 cm cyst and no solid or complex components

Meets *ED discharge criteria?

- Yes → Consider discharge and f/u in 6-8 wks, if ≥ 4 cm consider repeat US

Persistent cyst and symptomatic at follow-up?

- Yes → Admit to Ped Surg Ovarian-sparing surgery (Ovarian Cystectomy, complete mass excision)
- No → Resolved: No further imaging indicated

Complex Mass

≥8 cm cyst and/or Solid or complex components present

- Admit to Ped Surg
- Obtain ovarian tumor markers
- Multidisciplinary discussion of further staging & operative intervention considering Concerning Features

Suspicion of malignancy

- Low → Admit to Ped Surg Ovarian-sparing surgery (Ovarian Cystectomy, complete mass excision)
- High → **Salpingo-Oophorectomy** Peritoneal washings Inspection/biopsy of peritoneum, omentum, contralateral ovary, and retroperitoneal lymph nodes Surgical Staging

Pathology benign?

- Yes → Resolved unless symptomatic No further imaging indicated
- No → Multidisciplinary discussion of further staging

***ED Discharge Criteria**

- Pain controlled without opioid medications
- Tolerating liquids

Signs & Symtoms

Lower abdominal pain or pelvic pain
Most common symptom of torsion: sudden-onset abdominal pain that is associated with nausea and vomiting (ACOG article)
Possible radiation to abdomen, back or flank

Nausea +/- Vomiting (found to be an independent risk factor for ovarian torsion)

Known adnexal mass predisposes patient to torsion

Fever (possible with concurrent tubo-ovarian abscess)

Infants: feeding intolerance or inconsolability

Return to ED Algorithm

Return to Inpatient Algorithm

Definition, Background & Diagnosis

Definition of ovarian torsion:
Twisting of the ligaments that support the ovary and/or fallopian tube, resulting in decreased blood flow to the ovary. The fallopian tube may be torsed along with the ovary or may also torse on its own without ovarian torsion. Also referred to as adnexal torsion.

Ovarian torsion:
- Fifth most common gynecologic emergency
- 30% of all cases of ovarian torsion occur in females < 20 years old
- 64% of torsions occur on right side
- In pediatrics: majority of torsions occur with normal anatomy, although the presence of a mass increases the risk

Diagnosis:
- There is no clinical or imaging criteria sufficient to confirm the preoperative diagnosis of ovarian torsion
- Doppler flow alone should not guide clinical decision making
- A definitive diagnosis of ovarian torsion is made by direct visualization of a rotated ovary at the time of surgical evaluation
- Findings on ultrasound (transvaginal and/or pelvic) suggestive of ovarian torsion (sensitivity 84%):

Most sensitive findings on US:
- Ovarian edema
- Abnormal ovarian blood flow
- Relative enlargement of the ovary
- Possible free fluid or whirlpool sign (twisting of vascular pedicle in cross-section)
- Blood flow assessment compared to contralateral ovary

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Differential Diagnosis

Differential Diagnoses:

- Pregnancy
- Ectopic pregnancy
- Ruptured ovarian cyst
- PID/Tubo-ovarian abscess
- Appendicitis
- Mesenteric adenitis
- Adnexal mass
- UTI/pyelonephritis
- Kidney stones

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Recommended Evaluation

Labs:

- Serum or urine βHCG if patient ≥12 years of age or post-menarchal
- *CBC and CMP can also be obtained but lab abnormalities in ovarian torsion are often absent*

Imaging:

- US with Doppler (transvaginal and/or pelvic)
- *CT and MRI not generally utilized to diagnose ovarian torsion*

Consult GYN if high clinical suspicion

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IP Ovarian Tumor Markers Lab Panel

- AFP
- βHCG
- LDH
- CA125
- Inhibin A
- Inhibin B
- Testosterone by Mass Spectrometry
- Estradiol E2

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Consider Staging

- CT/MRI of Abd/Pelv
- CT of Chest

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Concerning Features

- **Clinical Findings:** Precocious puberty, virilization
- **Imaging:** Mass ≥ 8 cm, solid component, papillary projections, ill-defined borders, ascites, thick septations, extension into adjacent structures, lymphadenopathy, metastatic disease
- Hx ovarian malignancy

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Multidisciplinary Team

- Pediatric Surgery
- Pediatric Gynecology
- Surgical Oncology
- Oncology
- +/- Radiology

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Surgical Staging Guidelines

Surgical Staging Guidelines for Suspected Ovarian Malignancy (from the Children's Oncology Group)

The required components of surgical staging include:

- Cytologic assessment of peritoneal fluid
- Inspection of and biopsy of any abnormal appearing peritoneal surfaces, lymph nodes, omentum, contralateral ovary
- Removal of the primary tumor without violation of the tumor capsule in situ

Upon entering the peritoneal cavity, any peritoneal fluid should be collected for cytology. In the absence of fluid, peritoneal washings are collected for cytologic examination. The pelvic viscera are examined, and pelvic and retroperitoneal lymph nodes are palpated on both sides. The omentum and peritoneal surfaces are palpated and visualized. Specific findings about lymph nodes, omentum and peritoneal surfaces ***must be individually recorded in the operative note as normal or abnormal.*** Suspicious or enlarged lymph nodes should be biopsied. If the omentum is adherent or has nodules or implants, partial or complete omentectomy to include the lesions should be done. Studding of the peritoneal surfaces with nodules will require that multiple nodules be biopsied without sacrifice of adjacent organs.

All specimens should be sent ***fresh*** to pathology (no formalin).

Failure to document inspection and confirmation of normal appearance for omentum, peritoneal surfaces, lymph nodes and opposite ovary in the operative note may preclude eligibility for a clinical trial.

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Population & Metrics

Goals:

1. Expedient diagnosis and time to OR (less than 2 hours from diagnosis) for patients with ovarian torsion.
2. Ovarian sparing surgery for benign neoplasms and appropriate surgical staging for malignant neoplasms.

Population:

Inclusion:

1. Age: All
2. Diagnoses: Patients presenting to the ED and diagnosed with ovarian torsion or complex mass.

Metrics:

Process measures:

1. **ED**
    1. Roomed time to pelvic US order for patients ultimately diagnosed with ovarian torsion.
2. **IP**
    1. Case request order to surgical intervention within 2 hours.
    2. Complete surgical staging of malignant neoplasms.

Balancing measure:

1. Rate of unindicated oophorectomies for benign disease.

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Discharge Criteria & Follow Up

Discharge Criteria

- ED: Nausea resolved and pain controlled with non-opioid pain medication
- Post-Op: Tolerating diet, Abdominal pain controlled with oral pain medication, Age-appropriate vital signs

Follow Up

- ED discharge with simple cyst <4cm: Follow-up with PCP or Pediatric Surgery/ Pediatric Adolescent Gynecology in 6-8 weeks
- ED discharge with simple cyst ≥4cm: Follow-up with Pediatric Surgery/Pediatric Adolescent Gynecology in 6-8 weeks

Discharge Education

- Use the Discharge Instruction template ".DCOVARY" for post-op patients
  - **Helping Hand – Ovarian Neoplasm (If indicated)**
  - **Helping Hand – Gynecological Laparoscopy**

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Helping Hands

Gynecologic Laparoscopy

Ovarian Neoplasm

Ovarian Cyst and Torsion

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References

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Pathway Team & Process

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Advisory Committee Date: *April 2023*

Origination Date: *April 2023*

Next Revision Date: *April 2026*

Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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