Chronic Pelvic Pain in Adolescents

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Disclosures

Dr. Burgis has no relevant financial relationships to disclose.

Pelvic Pain in Adolescents

Many Causes

- Primary or Secondary
- Cyclic or non- Cyclic
- Acute or Chronic

Approach to the adolescent with dysmenorrhea, endometriosis, interstitial cystitis, müllerian anomalies, GI, myofascial pain

Pelvic Pain in Adolescents

- Often ***precise pathology*** not established
- Neurologic
- Gynecologic
- Urologic
- Gastrointestinal
- Musculoskeletal

Udoji and Ness, Painmanage(2013)3(5)387-394

Pelvic Pain in Adolescents

Current management includes

- Surgical
- Medication
- Physical Therapy
- Interventional procedures
- Complementary and alternative medicine

Learning Objectives

- Perform an appropriate history and evaluation of an adolescent with pelvic pain
- State the gynecologic causes of non acute pelvic pain
- Understand the guidelines for long term management of these patients

History

- **Confidentiality**
- History of Present Illness
- Past medical / surgical
- Menstrual history
- Family History
- Psychosocial history
  - HEADSS

Physical Examination

- **Taylor to age and maturity**
- Reassure the patient
- Exam components

✓ abdominal exam
✓ musculoskeletal exam
✓ Tanner stage
✓ external genitalia
✓ internal genitalia

Lab tests and Imaging Studies

- UPT, GCC, UA C&S to start
- Pelvic ultrasound *especially if patient is unable/unwilling to have pelvic exam*
- MRI

Ultrasound

- *Can* **define uterine and vaginal abnormalities**
- Can **delineate a pelvic mass**
- **Will not detect adhesions, endometriosis**

Symptom tracking

- ***Useful tool*** **for teens to track periods and symptoms**
- **Example: http://youngwomenshealth.org/PDFs/yearly_period_tracker.pdf**

Differential diagnosis for GYN Pain

Cyclic

- Dysmenorrhea
- Endometriosis
- Leiomyoma
- Obstructive anomalies
- Ovarian cyst/mass
- Fallopian tube

Non Cyclic

- Endometriosis/adeno
- Pelvic adhesions
- Chronic infection
- Obstructive anomalies
- PMS
- Fallopian tube/ovary
- Interstitial cystitis
- Vaginitis/vulvitis

Primary Dysmenorrhea

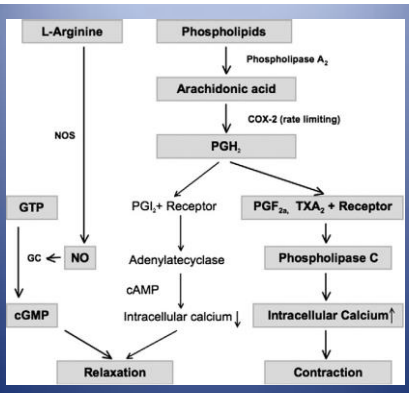
- Pain with menses
- Very common up to 90%
- 1-3 years after menarche
- Starts 1-4 hours prior to menses
- Lasts 1-2 days
- Nausea, vomiting, fatigue

Primary Dysmenorrhea

- Reported in 40% to 90%
- No identifiable cause
- Most common cause of missed school days
- Mediated by prostaglandins

Primary Dysmenorrhea

- **Uterus**: phospholipids converted to arachidonic acid
- Metabolized by lipoxygenase and cyclooxygenase
- Leads to cyclic endoperoxides
- Endoperoxides are converted to prostacyclin, thromboxanes, and prostaglandins
- Mediators of pain, smooth muscle contraction, platelet disaggregation, and vasodilation



H.-P. Zahradnik et al. / Contraception 81 (2010) 185–196

Primary Dysmenorrhea Treatment

- **Non Steroidal anti-inflammatory drugs (NSAID)**
- Analgesic and anti-inflammatory properties
- Inhibit cyclooxygenase
- Ultimately decreases prostaglandins
- Relieves dysmenorrhea and associated symptoms
- NSAIDs come in different classes

Primary Dysmenorrhea Treatment

- **Ibuprofen and naproxen** most widely studied
- Give pain relief in 67% to 86% of patients
- Fenomates inhibit prostaglandin formation and may antagonize that already formed
- May be useful when less expensive NSAIDs have not worked well

Primary Dysmenorrhea Treatment

- **Combination hormonal therapy (CHT)**
- Pills, rings, patch
- Lessen dysmenorrhea
- Prevent ovulation
- Induce endometrial hypoplasia
- Fewer prostaglandins

Primary Dysmenorrhea Treatment

- Dong quai, fish oil, vitamin E, vitamin B6
- Sometimes used little evidence
- Acupuncture, yoga
  - Some utility ……
  - Limited evidence to help

Heat Patch and Dysmenorrhea

- ***Turkish College students***
- Compared 3 groups
- Placebo, NSAID, and heat patch
- Found heat patch work synergistically with NSAID to relieve pain
- 4 times more effective

D.C. Potur, N. K€om€urc€u / J Pediatr Adolesc Gynecol xxx (2013) 1e6

Association of Vitamin D Status and Severity of Menstrual Pain

- Study of Middle Eastern College aged women showed no association between Vitamin D status and dysmenorrhea
- Found high prevalence of Vitamin D insufficiency and deficiency (25% and 16%)
- Implications for bone health

K.K. Abdul-Razzak et al. / J Pediatr Adolesc Gynecol 27 (2014) 78e82

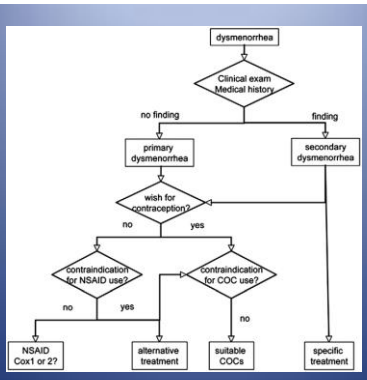
Effect of Acupuncture on Primary Dysmenorrhea

- 30 College Students
- SP6 accupoint
- Relieved dysmenorrhea
- Effect lasted 3 hours post treatment

N. Mirbagher-Ajorpaz 34 et al. / Complementary Therapies in Clinical Practice 17 (2011) 33e36

Primary Dysmenorrhea Treatment

- Patients need follow up in 2 to 3 months
- If symptoms fail to resolve **laparoscopy is indicated**
- Consider *endometriosis*, other organic causes



H.-P. Zahradnik et al. / Contraception 81 (2010) 185–196

Secondary Dysmenorrhea

- Painful menses attributed to ***pelvic pathology***
- 10% adolescent dysmenorrhea
- Prevalence in adolescents unknown
- **70%** of adolescents undergoing laparoscopy for refractory dysmenorrhea

Chronic Pain – persistent dysmenorrhea

For teens

- Missed school days
- Loss of social interaction
- Diagnosis is important as teens and parents may have concern about the diagnosis
- Evaluate unresponsive pain after 2 to 3 months
- Laparoscopy is invaluable

Laparoscopic findings in Adolescents with Chronic Pelvic Pain

FINDING	RATE
Normal pelvis	25–40%
Endometriosis	**38–45%**
Ovarian cyst	2–5%
Uterine malformations	5–8%
Postoperative adhesions	4–13%
Pelvic inflammation	5–15%
Others	2%

Stone SC: Pelvic pain in children and adolescents. In: Pediatric and Adolescent Gynecology. Edited by SE Carpenter and JA Rock. New York, Raven Press Ltd, 1992, pp 267–78

Chronic Pain – persistent dysmenorrhea

- **Endometriosis** : histopathological evidence of endometrial glands outside the endometrial cavity
- Present in 4% to 17% of postmenarchal teens
- 70% of adolescent girls undergoing laparoscopic evaluation of refractory dysmenorrhea
- Classic presentation less common in teens

Presenting Symptoms of Endometriosis in Adolescents

Symptom	Incidence
Cyclic and acyclic pain	62–95%
Acyclic pain	28%
Cyclic pain	9.4%
Dysmenorrhea	95%
Deep dyspareunia	29%
Irregular menses	9–25%
Gastrointestinal pain/nausea	34–43%
Urinary symptoms	12.5%
Vaginal discharge	6%

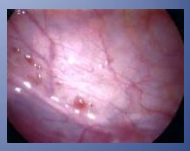
Laufer MR, Sanfilippo J, Rose G: Adolescent endometriosis: diagnosis and treatment approaches. J Pediatr Adolesc Gynecol 2003; 16:S3

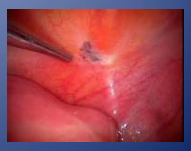
Etiology of Endometriosis

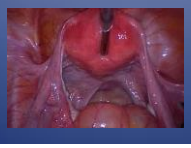
- **Sampson's** – retrograde menstruation
- **Meyer's** – embryologically totipotent cells that undergo metaplasia
- **Halban's** – spread through vascular of lymph
- Deficient cell mediated immunity
- Environmental exposures
- **Genetic predisposition – 6.9% rate in first degree relatives**

Endometriosis

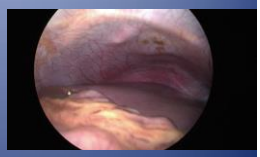
- Initial treatment – oral contraceptives and NSAIDs
- Laparoscopy if first line fails
- Medical therapy necessary following surgery

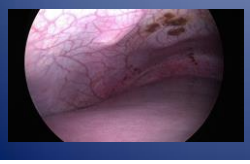






Endometriosis





Endometriosis – Surgical Therapy

- Diagnosis
- Destruction
- Excision
- Goal is to remove/ destroy all visible lesions

Endometriosis – Medical Therapy

- Medical management can achieve 2 goals
- **Pain control and disease progression**
- Combination hormonal therapy, used continuously (pills, patch, ring)
- Progestin - norethindrone, MPA, DPMA, progesterone IUD
- Gonadotropin – Releasing Hormone agonists (with add back therapy)

Endometriosis – Medical Therapy

- Add back therapy, goal to relieve side effects with out stimulating endometriosis growth
- Norethindrone acetate 5 mg a day
- After 9 months bone density test
- If normal bone density, may continue GnRH-a or switch to CHT or progestin
- Duration of therapy - unknown

Progression of Endometriosis in Non-medically Managed Adolescents

Case series of teens

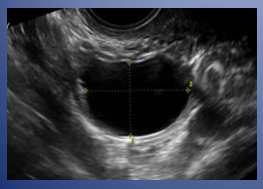
- Each diagnosed with Stage I endometriosis
- Each non compliant with medical follow-up therapy
- Each returned to the operating room
- Disease progression in each

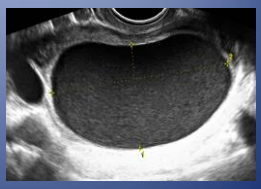
Unger,CA and Laufer, MR JPAG 24(2011)e21-23

Ovarian cysts

- Variation of a normal physiologic process
- Most simple cysts result from failed ovulation and involution
- Range of symptoms!!
- Most are "functional"
- ***"Ovaries make cysts for a living"***

Functional Ovarian Cysts





Diagnostic Tips

- **Best technique to evaluate is ULTRASOUND**

- <3 cm considered physiologic
- < 6 cm -- asymptomatic and fluid filled may be observed
- Oral contraceptives do not ***"shrink"***
- Surgical management – Ovarian cystectomy

Adolescent Adnexal Masses

- Eskander reviewed adolescent adnexal masses from 2003-2009
- Average age 11.9 years
- 190 surgical procedures
- Reviewed to evaluate operating surgical specialty and management differences

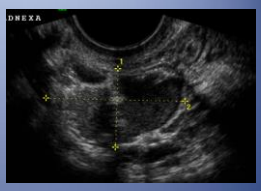
Eskander,RN et al. JPAG 24(2011)282-285

Adolescent Adnexal Masses

- 91% benign
- 8.9% malignant
- Ovarian preservation about 50%
- Combination of gynecologist and pediatric surgery provided optimum management

Eskander,RN et al. JPAG 24(2011)282-285

- Corpus luteum --- Imaging may vary
- Persistent bleeding or rupture may require surgical intervention
- Ovarian conservation preferred --- if bleeding can be managed by fulguration

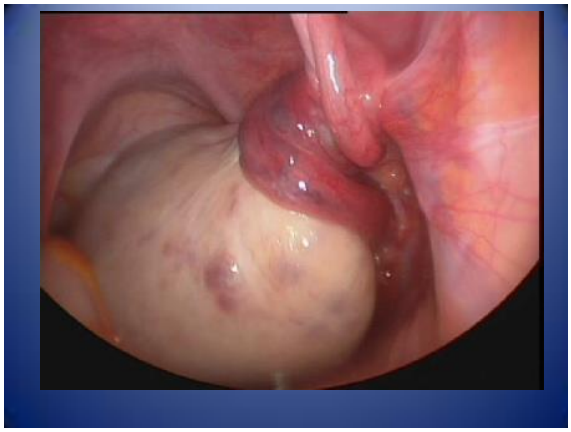


Ovarian Torsion

- **Right** more common than left
- Beaunoyer et al followed 76 children with torsion
- 51.2% had ovarian abnormalities:
  - Simple cyst
  - Cystadenoma
  - Hydrosalpinx
  - ***No malignancy***

Ovarian Torsion

- Ovarian torsion may occur with a cyst of any size, **R > L**
- Onset – acute, +/- fever, leukocytosis
- Torsed ovary ***always*** enlarged
- Ultrasound with doppler may aid in diagnosis
- Torsion of one adnexa increases the risk of torsion of the other adnexa
- Contemporary management - detorsion



Müllerian Anomalies

- Responsible for pelvic pain
- Many types, some obstructing
- ***Suspect*** obstructing anomaly in girls with primary amenorrhea and cyclic pain
- Mayer Rokitansy Küster Hauser (MRHK) – uterine remnants present- removal recommended

Müllerian Anomalies

- **Great resource:**
- **Center for Young Women's Health**
  - **www.youngwomenshealth.org**

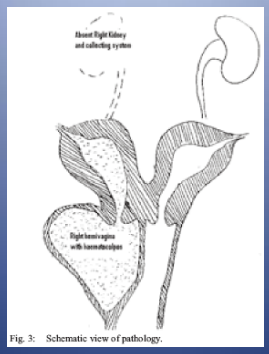


Fig. 3: Schematic view of pathology.

Müllerian Anomalies



Müllerian Anomalies

- **MRI** Best imaging modality
- 20% may have endometriosis
- Severe dysmenorrhea and pelvic pain
- Pain may be cyclic or acyclic

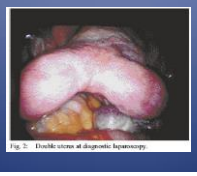


Fig. 2: Double uterus at diagnostic laparoscopy.

Pelvic Inflammatory Disease (PID)

- **Adolescents at increased risk**
  - physiology
  - behavior

Reported rates of chlamydia and gonorrhea rates highest in females aged 15-19

- **Sequelae include : infertility, ectopic pregnancy, chronic pelvic pain**

Pelvic Inflammatory Disease (PID)

- **CDC STD Treatment Guideline 2010**
- Inpatient/outpatient same as adults
- Clinical diagnosis may be imprecise
  - cervical motion tenderness
  - uterine tenderness
  - adnexal tenderness

Interstitial Cystitis

- No Consensus Criteria
- ***Does consist of***
  - -Bladder epithelial dysfunction
  - -Mast cell activation
  - -Bladder outlet nerve up regulation
  - -Dysregulation of sensory processing from spinal cord dorsal roots

Interstitial Cystitis – Presenting

- Frequency and dysuria
- Culture negative UTI, microscopic hematuria
- Sexual dysfunction is reported in up to 70% of females
- A history of sexual or physical abuse was noted in >50% of women in one cohort (Peters 2008)
- Trauma associated with abuse may be a trigger for myofascial or neuropathic pain found in many women with IC
- Risk factors: Caucasian females, smoking, food stimuli

Interstitial Cystitis

- **Represents:**

Chronic Inflammation

Sensory nerve overactivity

CNS over sensitizaton

Interstitial Cystitis (IC)

- C- fibers in the bladder urothelium and submucosa are activated or depolarized by potassium, thus causing pain
- Local mast cells release histamine, which in turn induces release of pain neurotransmitter substance P and induces proliferation of C-fibers
- Association with other pain conditions, environmental allergies, migraine headaches
- Associated with endometriosis- up to 81% in one cohort undergoing both laparoscopy and cystoscopy for CPP (Chung JSLS 2002)

Diagnosis of Interstitial Cystitis- History

- History of pain: 1. suprapubic, back, genital, vaginal, thighs. 2. vulvodynia or dysparunia 3. urinary frequency or irritative voiding
- Greater than 40% young women report exacerbation with menses or following intercourse
- Childhood or adolescent urinary retention or urgency or dysfunctional urinary or bowel habits
- Family history of IC

Diagnosis of IC- Exam Findings

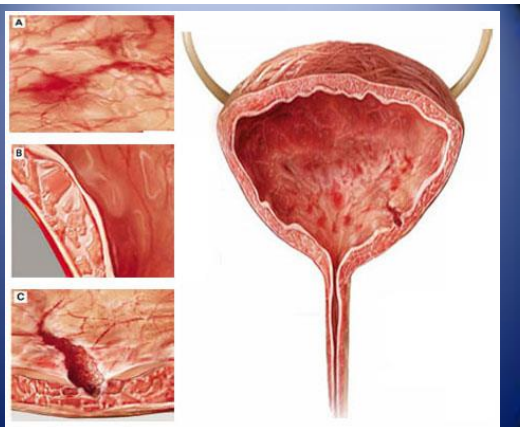
- Tenderness to palpation of the bladder neck (19-96%), levator ani muscle tenderness (37%), (suprapubic tenderness (32-50%), cervical motion discomfort (21%) (Teichman Urology 2007)
- Detection of myofascial trigger points in the rectus muscles or pelvic floor muscles

Interstitial Cystitis - Diagnosis

- **Voiding Diaries** may be helpful in detecting reduced bladder volumes and urinary frequency
- Mean voiding volume in women with IC 86-174 cc vs 289 cc in unaffected females with voids 17-25 times vs 6 in normal females (multiple studies)

Interstitial Cystitis - Diagnosis

- **Questionnaires** – none validated for diagnosis but can use to follow therapy
- **Potassium Challenge Test**
- **Cystoscopy** – NIH criteria 10 glomerulations in 3 of 4 quadrants, terminal hematuria



Intravesical Solutions for IC

- These solutions enhance the barrier effects of bladder surface mucus- may supplement oral therapies or use for "rescue" treatments
- Heparin 40,000 u in 10 ml water 1-2x/week
- Heparin best with Lidocaine 1-2%: with sequential instillation of 8.4% buffered Sodium bicarbonate to final vol of 10 cc
- Dimethly sulfoxide (DMSO)- 50-70% effective- only FDA approved intravesical therapy- anti-inflammatory, analgesic, muscle relaxant, collagen- degrading, bacteriostatic: 50 cc weekly x 6-8 wks- initially irritative
- Local drug delivery with limited efficacy in clinical trials

IC- Additional Therapies

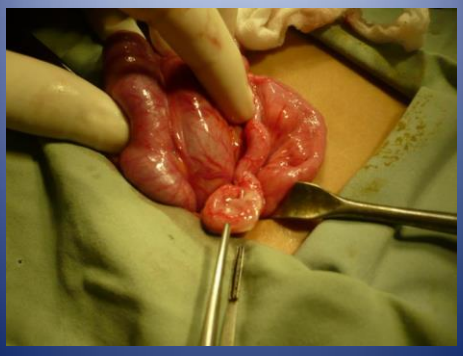
- Dietary restriction: caffeine fruits, alcohol, tomato products, spicy foods, diet soft drinks
- Physical therapy- most effective in pelvic floor muscle spasm or levator ani myofascial pain
- Sacral Neuromodulation- somatic afferent inhibition of sensory processing- initial temporary electrode in S3 foramen
- Surgical resection of ulcerative lesions or bladder diversion

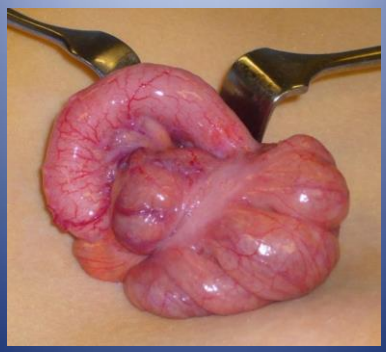
Therapy for Interstitial Cystitis

- Hydroxyzine, Cimetadine-antihistamines for controlling mast cell degranulation.(10-25 mg po qhs and 400 mg bid respectively)
- Tricyclic antidepressants- amitriptyline, nortriptyline-inhibit upregulation of sensory nerves- 10-25 mg po qhs and titrate up

Gastrointestinal Causes of Chronic Pelvic Pain

- Constipation- infrequent BMs and dietary choices
- Inflammatory bowel diseases – often present during the adolescent years
- Food allergies- especially lactose or gluten intolerance
- Chronic appendicitis- initial symptoms may mimic a gastroenteritis, dyspepsia, or functional abdominal pain- often without any systemic findings of fever or elevated WBCs



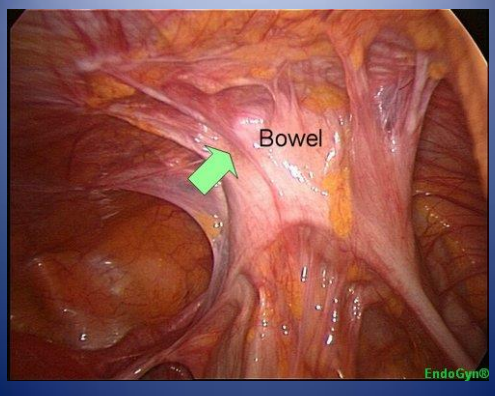


Irritable Bowel Syndrome (IBS)

- 20 functional GI disorders - 15-20% adolescents may have some symptom compatible with this dx
- Defined as chronic abdominal pain (mainly lower quadrants) and disturbed defecation without structural or biochemical abnormalities.
- Pain relieved with defecation
- Symptoms must be present for at least 12 weeks over the last 12 months without weight loss
- Diagnosis of exclusion

Other Causes of Abdominal Pain

- Constipation
- Inflammatory Bowel Disease
- Lactose Intolerance
- Peptic Ulcer Disease
- Functional Dyspepsia or Abdominal Pain
- Adhesions



Myofascial Pain in Adolescent Women

- Pain- defined by Intl Association for the Study of Pain: unpleasant sensory and emotional experience associated with actual or potential tissue damage
- Pain is in the abd wall, anatomic pelvis, LS back or buttocks- sufficient to cause functional disability
- Nociceptive pain=generally "somatic" or "visceral"- usually thermal, mechanical or inflammatory
- Somatic pain=activation of nociceptors in superficial tissues- well defined, localized- skin(local, well defined), or tendons, ligaments, fascia, muscles (dull aching or poorly localized)
- Visceral pain=usually difficult to locate, often referred pain due to limited visceral afferents compared to somatic afferent pain

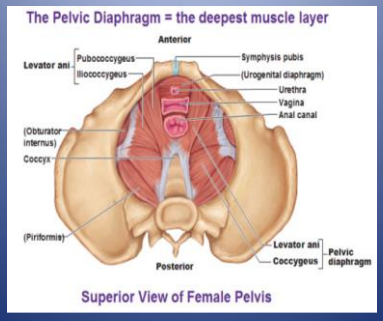
Myofascial Pain

- 6- 50 % adolescents in studies with pain up to 3 mos, 25 % > 3 mos.
- Prevalence greater in women, incidence rises appreciably at 12-14 years
- Trigger points- initial insult is trauma- with alteraltion of the sarcoplasmic reticulum and release of Ca++ ions causing a local contraction. Nutrients are diverted from adjacent muscle- producing de-functioned muscle and subseq weakness
- Myofascial can result from visceral disease (viscero-somatic reflex)

Clinical Evaluation of Chronic Pelvic Pain

- **Cutaneous allodynia-** "q-tip test"- primarily T10-L1 dermatomes- findings also positive in pts with endometriosis (bilateral) and IC (midline)
- **Trigger Points** - identified within areas of cutaneous allodynia- abd wall or perineum- most fre R/L lower quad where abdominus m. meet ext oblique – best felt with flat finger areas- nodules or bands. Often appear to radiate to bizzare areas- back, chest, legs- pain projected through the fascia of the muscles
- **Pain Threshold Measurement-** careful clinical exam or dolorimeters

Clinical assessment of Pelvic Pain



Support and Education

- Teens benefit from chat rooms, blogs, support groups
- www.youngwomenshealth.org
- Educational material for families is also available at that website

Learning Objectives

- Perform an appropriate history and evaluation of an adolescent with pelvic pain
- State the gynecologic causes of non acute pelvic pain
- Understand the guidelines for long term management of these patients