TRANSGENERAL DRAINAGE
Tubo-Ovarian Abscess

TRANSGENERAL DRAINAGE
Needle Aspiration

Transvaginal Drainage

Transvaginal Probe
Set Up

ULTRASOUND GUIDED
TRANSGENERAL DRAINAGE
Advantages
- Real time monitoring (US)
- Direct approach to collections
- ? less pain (vs. transgluteal approach)

ULTRASOUND GUIDED
TRANSGENERAL DRAINAGE
Potential Problems
- Low lying bowel
- Catheter buckle
- Fluoroscopy may be necessary (Seldinger technique)
- Fixation of catheter (locking catheter)
Anatomic Issues

Transgluteal Drainage

Less complicated than you think
Less painful than you think
Allows more options for drainage
Underutilized

TRANSGLUTEAL
Anatomic Considerations

TRANSGLUTEAL
Avoid Bowel
Transgluteal Technique

Access route chosen
Needle placed

Advantages of Transgluteal Approach

- Efficacy 88%
- Quick in experienced hands
- Avoids combined drainage (US/Fluoro)
- Damage to neurovascular bundle over-estimated
- Pain over-estimated

Liver Abscess
Antibiotics Work

Pre Treatment
Post Treatment

Diverticulitis

Diveritcilitis
DRAINAGE OF ENTERIC ABSCESSES

**PHILOSOPHY**
- Drain the abscess
- Temporize for surgery
- Potential cure

---

**Nonsurgical Drainage of Appendiceal Abscesses**

- Elderly patient: Palliative
- Co-morbid disease: Controversial

---

**PERI APPENDICEAL INFLAMMATORY MASSES**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phlegmons / small abscesses (&lt; 3 cm)</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>Well defined abscesses (localized)</td>
<td>Percutaneous</td>
</tr>
<tr>
<td>Diffuse non-localized abscess</td>
<td>Surgery</td>
</tr>
</tbody>
</table>


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**PERI APPENDICEAL INFLAMMATORY MASSES**

**Results**
- Phlegmon →/ antibiotics: 90%
- Abscess / PAD: > 90%
- Diffuse abscess / surgery: > 90%


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**Appendiceal Drainage**
IMPORTANT FEATURES IN APPENDICEAL DRAINAGE

- Extra appendiceal spread of infection
- Presence of communication with bowel
- Interval appendectomy

Left Subphrenic

CROHN’S DRAINAGE

CROHN’S DISEASE
Difference From Appendicitis/Diverticulitis

- Chronic recurrent disease
- Fistulas more of a concern
- Like to avoid surgery
- Chron Disease (politically correct)

CROHN’S DRAINAGE

No Fistula

CROHN’S DISEASE

No Fistula

Barium –6 weeks post drainage
Appendiceal Drainage

DRAINAGE OF ENTERIC ABSCESSES
- Diverticulitis
- Crohn's Disease
- Appendicitis

DIVERTICULITIS
Staging

DIVERTICULITIS
Healing Communication

CROHN'S DISEASE
Percutaneous Abscess Drainage
- Without fistula: > 90% Success
- With fistula: Most patients require surgery at some time (temporize)
TROCAR TECHNIQUE
Not Always Easy

CROHN’S DISEASE

DIVERTICULITIS
Differential vs Tumor

Diverticulitis vs Tumor

CROHN’S DISEASE
Fistula with Colon
**CROHNS**
Communication to Colon

**CROHN’S DRAINAGE**
Why ?
1) Reduce operations
2) Make operations easier
3) Possible temporary cure
4) Fistulas common, but curable

**DIVERTICULAR DRAINAGE**
Why ?
1) Allow single stage surgery
2) Temporize ill patients
3) Downstage surgical stage
4) Does not preclude surgery

**FOLLOW-UP**
DAILY ROUNDS ON ALL PATIENTS
- Prevent catheter blockage
- Check catheter fixation
- Review patient comfort
- Discuss management with floor staff

**Appendiceal Drainage**

Pre-Irrigation  Post-Irrigation
INTRODUCTION

Drainage of pelvic fluid collections
- Anterior approach (US, CT, Fluoroscopy)
- Transgluteal (CT)
- Transrectal (US/Fluoroscopy, CT)
- Transvaginal (US/Fluoroscopy)

RECENT DEVELOPMENTS

TRANSRECTAL
- Effective
- Requires combination of US and fluoroscopy
- Small number of patients evaluated
- Small-bore catheters only
- Catheter fixation difficult

ANTERIOR ABDOMINAL APPROACH
- Deep collections difficult to drain
- Neurovascular bundles
- Intervening bowel and bladder
- Possible approach parallel to iliac wing

Diverticular Abscess

What Access Route?

One Week
DIVERTICULITIS
Fistula Connection

Diverticulitis
1) Drainage palliative prior to surgery
2) Fistula to colon common
3) Patient – home with catheter
4) Catheter may remain in for weeks

Standard Abscess Drainage

STANDARD ABSCESS DRAINAGE
Routine Questions
Access route
Follow up – Clinical
Drainage over time
Fistula communication
Cure Expectations

Appendicitis

Appendicitis
**Diverticulitis**

**SUBPHRENIC ABSCESS**
2\(^{nd}\) Manipulation

**SUBPHRENIC**
Incomplete Drainage

**Value of 2\(^{nd}\) Manipulation**

**Tandem Technique**
SUBPHRENIC ABSCESS
US/Fluoro – Multihole Catheter

Subphrenic Abscess

Large surface area
Subcostal

Transgluteal Drainage

Appendicitis

POST WHIPPLE
Anastomotic Leak

Multiple Catheters
Multiple Abscesses

No obstruction: Drain abscess and leak will close
Multiple Abscesses
Multiple Catheters

Infected Hematoma
Why Failed Drainage?

CATHETER CHOICES
12 Fr
10 Fr
16 Fr

Trocar Technique

LIVER ABSCESS
Expected Results
Uniocular, well developed 100%
Multioculated, fistula 80-90%
Early, poorly developed ?

PYOGENIC LIVER ABSCESS
Percutaneous Drainage
International Results
127 Patients
84% Success

American Surgeon 1985 (May, p. 407-11) USA
Medicine 1996 (March, p. 59-113) Mexico
Multiloculated Abscess

Whither Catheter Injection?

Fluid Analysis

<table>
<thead>
<tr>
<th></th>
<th>Gram Stain</th>
<th>WBC's</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel contents</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Pyogenic abscess</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Treated abscess (antibiotics)</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

When do I

Irrigate
Remove Catheter
Perform Abscessogram
Worry!
How do I tell that I have an abscess?

SAFE ACCESS ROUTE
Where is the Bowel?

Where is the Bowel?

Identify the Bowel

Fistula Communication
Amount of drainage / Time
Character of drainage
Imaging shows no collection
Long term catheter drainage
Patience
PYOGENIC LIVER ABSCESS

Failure of Percutaneous Drainage

1° Biliary Disease

Incomplete Drainage

Multiloculation