SONOGRAPHIC DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF ACUTE SCROTUM IN CHILDREN

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• The diagnosis of acute scrotal pain and swelling in children is urgent and often difficult.

• The major problem in the acute scrotum is the diagnosis.

• Once the diagnosis is established, treatment is straightforward.

• The imaging of acute scrotum plays a critical role in decision making process whether exploratory surgery is necessary.
Anatomy

FORMATION OF THE SCROTUM

• The scrotal sac is formed by envagination of the peritoneal layer-processus vaginalis starting in early fetal life.

• The testis descends into the scrotum retroperitoneally.

• The processus vaginalis closes proximally while the distal part remains patent covering the anterior and lateral parts of testis like an apron.
Anatomy

1 Cutis
2 Dartos
3 External Spermatic
4 Cremasteric
5 Internal Spermatic
6 Parietal Vaginalis
7 Visceral Vaginalis
8 Albuginea
ACUTE SCROTAL CONDITIONS:

- Epididymitis and Orchiepididymitis.
- Torsion of testicular appendix.
- Torsion of testis.
- Scrotal trauma.
- Hernia.
- Idiopathic scrotal edema.
CLINICAL APPEARANCE

Swollen hemiscrotum

Painfull and hard testis

Redness with different intensity

Diagnostic dilemma

Sonographic imaging is a method of choice for exact diagnosis!
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

Normal testis

Homogeneous echotexture.

Hyperechoic.

Albuginea is not visualised.

Tunica vaginalis is not seen.

Triangular Epididymis with equal echogenicity
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

- Doppler Imaging of normal testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 1
9 yrs old boy with painful and swollen left testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 1
Colour Doppler
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 1
Colour Doppler

Diagnosis: Epididymitis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 2
6 yrs old boy with swollen left hemiscrotum. Painful and hard left testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 2

Diagnosis: Epididymoorchitis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 3
10 yrs old boy with swollen left hemiscrotum. Painful left testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 3
10 yrs old boy with swollen left hemiscrotum.
Painful left testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 3
10 yrs old boy with swollen left hemiscrotum.
Painful left testis

Diagnosis: Post traumatic haematocele
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 4
A new born with redness of left hemiscrotum.
Swollen left hemiscrotum.
Tender and painful left testis
Absent cremasteric reflex
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 4
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 4
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 4

Doppler study:
Severe ischemic changes leading to necrosis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 4
Diagnosis: Intrauterine, extra vaginal type of left testicular torsion. Necrotic testis
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 5
10 months old boy with swollen left hemiscrotum. Redness and pain on the left side. Hard left testis. Absent cremasteric reflex
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 5

Doppler:

- Hyperaemic periphery
- No testicular blood flow
SONOGRAPHIC DIAGNOSIS OF ACUTE SCROTUM

CASE 5

Rt normal testis and appendix. Lt testicular necrosis

Diagnosis: Torsion of the left testis and appendix
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and

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Montreal, Quebec, Canada
A NEW SONOGRAPHIC SIGN OF TORSION OF TESTICULAR APPENDIX IN PAEDIATRIC AGE GROUP

Dr Hassan Nougud - Consultant Padiatric Surgery, Al Wasl Hospital, Dubai
MAJOR TESTICULAR APPENDAGES:

APPENDIX EPIDIDYMIS
- REMNANT OF THE MESONEPHRON

APPENDIX TESTIS
- REMNANT OF THE MULLERIAN DUCT

APPENDIX VAS
- REMNANT OF THE MESONEPHRON
THE TESTICULAR APPENDICES ARE PEDINCULATED AND PRONE TO EASY TORSION

1 TORSED APPENDIX
2 TESTIS
3 SWOLLEN EPIDIDYMIS
THE CURRENT SONOGRAPHIC DESCRIPTION OF TORSION OF THE TESTICULAR APPENDAGES INCLUDES:

- HYPOECHOIC MASS
- HYPERECHOIC MASS
- ECHOIC NODULE

VERY OFTEN IT IS CONFUSING

OUR EFFORT IS TO CONTRIBUTE TO MORE PRECISE SONOGRAPHIC DESCRIPTION OF THE MOST CHALLENGING CONDITION OF ACUTE SCROTUM IN PEDIATRIC AGE GROUP
WE HAVE 14 CASES OF SCROTAL EXPLORATION FOR SUSPECTED TORSION OF TESTICULAR APPENDIX DURING THE LAST 3 YEARS (2003-2005)

5 CASES ARE SONOGRAPHICALLY DIAGNOSED AND SURGICALLY PROVED

THE BOY'S AGE VARY BETWEEN 3 AND 11 YEARS

ALL EXAMS ARE PERFORMED WITH HIGH RESOLUTION (7-12 Mhz) LINEAR PROBE

WHAT WE FOUND REVISING THE VIDEOTAPES?
CASE 1

AGE – 3 YRS OLD BOY

HISTORY – PAIN IN THE RIGHT TESTIS

USS FINDINGS:

THICKENING OF SCROTAL WALL
THICKENING OF TESTICULAR TUNICA ALBUGINEA
ENLARGED EPIDIDYMIS

WITH DOPPLER
NORMAL BLOOD FLOW

THE APPENDIX SHOWS BRIGHT HYPERECHOIC DOTS AND LINES

WITH DOPPLER
NO BLOOD FLOW
HISTOPATHOLOGY

- NECROTIC CHANGES
- INFLAMATION
- CONGESTIVE BLOOD VESSELS
CASE 2

AGE 4 YRS OLD BOY

HISTORY: PAIN IN THE LEFT TESTIS

US FINDINGS:

- TESTIS – HYPEREMIC
- EPIDIDYMIS – ENLARGED, HYPEREMIC
- SCROTAL WALL - THICKENING

APPENDIX – ENLARGED AND SHOWS HYPERECHOIC DOTS AND LINES

DOPPLER: NO BLOOD FLOW
OPERATIVE FINDINGS:

THE SIZE OF EPIDIDYMIS IS EQUAL TO THE TESTIS

THE PEDICULATED APPENDIX IS TORSED AND NECROTIC
CASE 3

AGE- 10 YRS OLD BOY
HISTORY- PAIN IN THE LEFT
TESTIS (2 HRS DURATION)

US FINDINGS:
TESTIS – NORMAL
EPIDIDYMIS – NORMAL
APPENDIX – SLIGHTLY
ENLARGED AND SHOWS
HYPERECHOIC DOTS AND
LINES

DOPPLER – NO BLOOD FLOW
OPERATIVE FINDINGS

SLIGHTLY ENLARGED APPENDIX

MILD CONGESTION

NORMAL TESTIS
CASE 4

10 yrs old boy
Swollen left hemiscrotum
Tender left testis.
Painful left testis
Skin redness
CASE 5

AGE - 10 YRS OLD BOY

HISTORY – PAIN IN THE LEFT TESTIS (3 DAYS DURATION)

TESTIS – THICKENING OF TUNICA ALBUGINEA, NORMAL BLOOD FLOW

EPIDIDYMIS – ENLARGED AND HYPERAEMIC

APPENDIX – ENLARGED AND SHOWS HYPERECHOIC DOTS AND LINES

DOPPLER – NO BLOOD FLOW
CHONDRAL ECHOTEXTURE
OPERATIVE FINDINGS:

ENLARGED EPIDIDYMIS

NECROTIC APPENDIX
WHY CHONDRAL SIGN?
US OF NEONATAL FEMORAL HEAD

The chondral echotexture shows bright hyperchoic dots and lines.
SONOGRAPHICAL SIMILARITY

TORSED APPENDIX

NEONATAL FEMORAL HEAD
SONOGRAPHICAL SIMILARITY

TORSED APPENDIX

NEONATAL HUMERAL HEAD
CONCLUSIONS:

WE BELIEVE THE SONOGRAPHIC CHONDRA SIGN OF TORSED TESTICULAR APPENDIX IS RELIABLE AND VERY PROMISING FOR ACCURATE SONOGRAPHIC DIAGNOSIS AND WILL REDUCE SIGNIFICANTLY THE EMERGENCY SCROTAL EXPLORATION.

WE RECOMMEND HIGH RESOLUTION ULTRASON SCANNING WITH SEARCHING OF THE MAJOR SONOGRAPHIC SIGNS OF APPENDICULAR TORSION:

1. CHONDRA SIGN
2. SCROTAL WALL THICKENING
3. ENLARGED AND HYPEREMIC EPIDIDYMIS
4. AVASCULAR APPENDIX
5. TUNICA ALBUGINEA THICKENING
THANK YOU