

# Diagnostic Adequacy and Safety of Percutaneous Ultrasound Guided Pediatric Liver Biopsy

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# Background

- At Stollery Children's Hospital , percutaneous ultrasound guided pediatric liver biopsies are performed by radiologists with the patients under sedation.
- The balance between obtaining enough tissue for accurate histological diagnosis and minimizing complications associated with biopsy is important.
  - Pain, infection, bleeding, puncture of other organs, and anesthetics-related complications.

# Aim of the Study

- To assess our biopsy adequacy.
- To determine the optimal length of biopsy core.
- To unify the approach to pediatric liver biopsy in our institution.

# Methods

- All pediatric liver biopsies in a period of 2 years (July 1, 2011 - June 30, 2013) were reviewed.
- Data Collection
  - Patient age
  - Indication for biopsy
  - Needle type and throw
  - Number of passes
  - Operator
  - Details of post-procedural complications
  - Final pathology reports

# Results

- 57 pediatric liver biopsies were performed by 7 radiologists in 2 years.
- The age of the patients:
  - 13 days old – 17 years old.
- Indications for biopsy:
  - Liver transplant follow-up, unexplained elevation in liver enzymes, hepatitis, biliary atresia, Wilson's disease, PSC, suspected malignancy.

# Results

- 18 gauge core needles were used in all biopsies.
- 3 different lengths of throws (13, 23, 33 mm) were used.



# Results

- Correlating with the pathology reports, accurate diagnosis requires:
  - A minimum of 6 portal tracts.
  - Ideally more than 10 portal tracts.
- 13 – 15 mm of biopsy core provides at least 10 portal tracts.

# Results

- 54 (95%) biopsies provided adequate amount of tissue samples for accurate diagnosis.
  - Among the 54 biopsies:

Biopsy core length	Number of biopsies (%)
> 13 mm	47 (87%)
10 – 13 mm	7 (13%)

- The 7 biopsies  $\leq$  13 mm provided 6 – 8 portal tracts, reaching the minimum diagnostic requirement.



# Results

- 2 (3%) biopsies did not provide enough tissues:
  - Both biopsies provided core < 10 mm.
  - One provided 2 portal tracts, and the other provided 3 portal tracts.

# Results

- Complications:
  - 1 (2%) biopsy provided only lung tissues.
    - No pneumothorax identified on subsequent chest radiographs.
  - No significant bleed (0%).
  - No anesthetics-related complications (0%).

# Discussions

Biopsy core length	Diagnostic adequacy
> 13 mm	Adequate
10 – 13 mm	Minimally adequate
< 10 mm	Inadequate

- Conclusion:
  - The ideal biopsy core should be longer than 13 mm.

# Recommendations

- 18G core needle is adequate for pediatric liver biopsy.
- New protocol implemented since 2014:
  - Use 23 mm throw when the width of liver > 20 mm, to ensure that the biopsy core length > 13 mm.

23 mm



- Use 13 mm throw x 2 when the width of liver < 20 mm.

13 mm

