Diagnostics in Liver Diseases

7 Liver biopsy and laparoscopy

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1 Liver biopsy

Exceptions apart, it is impossible or nearly impossible to meet the essential target of a *detailed diagnosis* for hepatobiliary disease without additional histological sampling. Morphological diagnostics is based on **three examination methods,** the diagnostic relevance of which can be improved with a number of *additional techniques.* (s. tab. 7.1)

Examination methods

1. **Liver biopsy**
   a. percutaneous biopsy
      − ultrasound-guided biopsy
      obsolete: percussion-guided biopsy
   b. *rare:*
      • transjugular venous biopsy
      • transfemoral venous biopsy
2. **Laparoscopy**
   a. without biopsy
   b. with guided thick needle biopsy
   c. with guided fine needle biopsy
   d. with guided forceps biopsy
3. **Fine needle biopsy**
   a. ultrasound-guided
   b. computer tomography-guided

Additional techniques

1. Photodocumentation for *every* laparoscopy
2. UV-light examination of *each* liver biopsy specimen
3. Special morphological processing
   a. various staining techniques
   b. histochemical methods
   c. immunohistochemical stains
   d. immunofluorescence examinations

Tab. 7.1: Morphological examination methods and additional techniques for the clarification of hepatobiliary diseases

► *For this reason, the aim should always be a combination of clinical, laboratory, sonographic and morphological diagnostics.* This is important because morphological changes in the liver can remain concealed from clinical and laboratory detection − just as striking laboratory findings are not necessarily reflected in the bioptic material. • Moreover, *liver bioptic material is not always representative* of the underlying liver disease or the actual normality of the liver parenchyma − whereas an increase of GPT in the individual case always points to liver cell damage. • Even if sonography is deemed to be a routine examination in clarifying hepatobiliary diseases, *it cannot provide any histological statement.*

1.1 Historical development

► In cases of purulent echinococcus, puncture of the liver was carried out by Récamier as early as 1825 and by Stanley in 1833. In 1844, the diagnostic opportunities of liver biopsy were discussed in France by A. G. M. Vernois. • In his book "On diabetes" (1884), F. Th. Frerichs reported on the **first liver biopsy**, which was carried out by P. Ehrlich in Berlin in 1880. This publication included illustrations of the biopsy instruments used and the liver tissue removed. • In 1895 L. Lucatello reported on liver biopsy as a method of diagnosis, the cytomaterial being examined as smear or teased-out preparation. Using the thicker needle developed by F. Schupfer (1907), successful liver and spleen biopsies were carried out, so that the tissue cylinder could be assessed histologically as well. (140) A. Josefson (1920) also succeeded in performing liver biopsies in some cases. (73) A. Bingel (1923) (8) and J. Olivet (1926) (114) reported from the same hospital on systematically performed liver biopsies. • A **new aspiration method** with modified biopsy needles was presented by I. Silverman (1938, 1954) (144) as well as by P. Iversen and K. Roholm (1939). (67) Yet even this new technology failed to help liver biopsy achieve full recognition as a clinical method despite the fact that W. Kofler (1940) had termed liver biopsy "a useful and clinically important examination method" on the basis of over 100 specimens. (77) • The following years witnessed more publications on this examination method. (3, 5, 32, 48, 109, 128, 156, 169−171) ***Nevertheless, liver biopsy was almost completely excluded from the world of clinical diagnosis.*** (s. tab. 7.2)

First performance of liver biopsy		
1880	P. Ehrlich	Berlin[1)]
1895	L. Lucatello	Roma[2)]
1907	F. Schupfer	Firenze[2)]
1923	A. Bingel	Braunschweig[1)]
Second stage in method development		
1926	J. Olivet	Marburg[1)]
1935	P. Huard et al.	Paris[7)]
1938	I. Silverman	New York[3)]
1939	E. Baron	New York[3)]
1939	P. Iversen et al.	Kobenhavn[4)]
1940	W. Kofler	Wien[5)]
1943	J. H. Dible et al.	London[8)]
Third stage as Menghini technique		
1957	G. Menghini	Perugia[2)]
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Ultrasound- and CT-guided biopsy		
1964	Wang Hsin-Fang et al.	Shanghai[6)]
1972	S. N. Rasmussen et al.	Hjallerup[4)]
1976	J. R. Haaga et al.	Cleveland[3)]
1983	L. Greiner et al.	Wuppertal[1)]

Tab. 7.2: Historical development of percutaneous liver biopsy (1 = Germany; 2 = Italy; 3 = USA; 4 = Denmark; 5 = Austria; 6 = China; 7 = France; 8 = Great Britain) (city names are given in the original language)

► In 1957 (not 1958 as is usually and wrongly quoted!) G. Menghini presented the first report on a new biopsy method: using thin-walled, small calibre needles with a sharply slanting bevel and without a trocar, it was pos-