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Standardized reporting of histological diagnoses for non-neoplastic liver conditions in needle biopsies

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Abstract The importance of standardizing surgical pathology reports is emerging from the literature. The use of checklists has recently been proposed for diagnosing the major tumour types, but no attention has been given to non-neoplastic conditions. In this paper a checklist for standard reports of liver needle biopsies for non-neoplastic conditions is presented.

Key words Liver needle biopsy · Checklist · Histology · Standard report

Introduction

Recently the importance of standardizing surgical pathology reports has been emphasized [1]. Attention has been directed towards improving the amount and quality of the information included in surgical pathology reports, in an attempt to provide clinicians with all the variables useful for treatment of the patients, omitting unnecessary morphological details [6, 7, 21]. In this respect the usefulness of checklists giving all relevant data for tumour grading and staging has been discussed [21]. It is important, from the clinical point of view, to standardize the information recorded in the histological reports, from different observers, and for this purpose a series of checklists has recently been proposed by Rosai et al. [13]. Presently most attention has been focused on neoplastic pathology and none of the schemes has been proposed for non-neoplastic conditions. Histological evaluation of needle biopsies of the liver is of value in the assessment of hepatic diseases in most patients [2, 3, 14, 16]. In addition some histological features, such as piecemeal necrosis, bridging necrosis and lobular inflammation, are predictive of the evolution of viral hepatitis [2, 3, 14–16]. Furthermore, in chronic viral hepatitis histological features are useful in determining grading and staging of the disease, which are concepts recently proposed [5].

The purpose of this paper is to present a detailed and reproducible report form on which features of diagnostic and prognostic interest can be easily retrieved and compared, when dealing with needle biopsies of non-neoplastic liver conditions.

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Materials and methods

The checklist (Table 1) concerning non-neoplastic liver pathology was completed with the aim of specifically analysing each structural component of the liver tissue present in the biopsy: architecture, portal tracts, ductules, hepatocytes and centrolobular veins. In addition, those well-established morphological features which can be of help in the general evaluation of the patient are also included in the text. Accordingly, the checklist is divided into two parts: the first section concerns description of the histological features and in the second section the diagnostic conclusion is provided. In the first part the architecture, portal tracts and lobular parenchyma are described separately. Architecture is the first variable considered, as it is important in the evaluation of liver scarring [16]. The degree and extent of fibrosis are described according to the guidelines provided by Desmet et al. [5], in order to provide information useful for the staging of chronic hepatitis. When examining portal tracts, the type and distribution of inflammation (follicular versus diffuse), [9] and its degree (minimal/mild/moderate/severe) [8, 17, 18] and piecemeal necrosis have been taken into consideration.

Sentences describing features of granulomatous inflammation are then added. As ductular lesions can be part of the changes seen in viral hepatitis [9, 10] and can constitute the main alteration seen in other conditions, a specific paragraph has been devoted to ductular changes. When liver lobules are taken in consideration, inflammation and necrosis are included. These latter changes are graded as absent/minimal/mild/moderate/severe according to Scheuer [17, 18]. Grading of piecemeal necrosis and of lobular inflammation is offered in an attempt to measure the severity of the necroinflammatory process [5].

Thereafter the elements of the liver lobules, such as changes seen in Kupffer cells, sinusoids, central veins and hepatocytes, are also considered specifically. Special stains (both histochemical and immunohistochemical), when required to enhance specific

Table 1 Checklist for liver needle biopsy (non-neoplastic conditions)

Liver – Needle biopsy

Case number:
Patient name:
Date of birth:

Histological description

1. Needle biopsy of liver parenchyma, with preserved architecture. No fibrosis is observed.

2. Needle biopsy of liver parenchyma with periportal fibrous expansion (mild fibrosis).

3. Needle biopsy of liver parenchyma with portoportal septa (moderate fibrosis).

4. Needle biopsy of liver parenchyma with portocentral septa (severe fibrosis).

5. Needle biopsy of liver parenchyma with replacement of the normal liver architecture by nodules separated by complete fibrous septa.

6. Portal spaces are
( ) devoid of inflammatory infiltration (grade 0).
( ) devoid of alterations.
( ) absent.

7. Portal spaces are enlarged by fibrous tissue deposition, and contain minimal/mild/moderate/severe chronic inflammatory cell infiltration, mainly composed of lymphocytes and plasma cells. Lymphocytes are arranged in lymphoid follicles with germinal centres. The lymphocytes
( ) do not infiltrate the adjacent liver parenchyma (grade 1).
( ) focally/diffusely infiltrate the adjacent liver parenchyma (mild/moderate/severe piecemeal necrosis, grade 2/3/4).

8. In addition eosinophil/neutrophil granulocytes are present.

9. Portal spaces are enlarged and contain mononuclear inflammatory infiltration, with non-necrotizing granulomas.

10. Ductules are:
( ) normal.
( ) absent.
( ) increased in number.
( ) infiltrated by lymphocytes.
( ) infiltrated by neutrophils.
( ) infiltrated by eosinophils.
( ) dilated and contain bile plugs.

11. In the lobular parenchyma no activity is observed (lobular inflammation grade 0).

12. In the lobular parenchyma minimal activity is observed, composed of inflammation without necrosis (lobular activity grade 1).

13. In the lobular parenchyma mild lobular activity is observed, composed of focal hepatocellular necrosis (apoptotic bodies) with inflammation (lobular activity grade 2).

14. In the lobular parenchyma moderate lobular activity is observed, composed of focal hepatocellular damage with inflammation (lobular activity grade 3).

15. In the lobular parenchyma severe lobular activity is observed composed of severe hepatocellular damage and bridging necrosis (lobular activity grade 4), which is
( ) portoportal.
( ) portocentral.

16. The following features are additionally observed:
( ) intraparenchymal non-necrotizing epithelioid granulomas.
( ) bile thrombi.
( ) activation of the reticulo-endothelial system.
( ) acidophilic bodies (apoptotic bodies).

17. Sinusoids are devoid of alterations.

18. Sinusoids appear to be focally/diffusely dilated, in the centrolobular/periportal area.

19. Sinusoids contain
( ) small lymphocytes.
( ) granulocytes.
( ) megakaryocytes and cells of the erythroid and myeloid series.

20. Kupffer cells contain fine/coarse granules of iron pigment, evidenced with Perl's stain.

21. Kupffer cells contain ceroid pigment.

22. Centrolobular veins appear devoid of alterations.

23. Centrolobular veins show fibrous thickening of their walls, from which fibrous septa depart and surround adjacent hepatocytes.

24. Centrolobular veins contain thrombi.

25. Hepatocytes appear devoid of alterations.

26. . . .% of hepatocytes, located in zone 1/2/3 of the hepatic lobule

27. . . . are organized in solid sheets.

28. . . . show features of
( ) micro/macrovesicular steatosis.
( ) feathery degeneration.
( ) balloon degeneration.

29. . . . show atypical and hyperchromatic nuclei, some of them being multinucleated.

30. . . . contain nuclear inclusions of Cowdry's type (herpes)/cytomegalovirus type/glycogen vacuoles.

31. . . . show finely granular cytoplasm (ground glass cells).

32. . . . contain intracytoplasmic fine/coarse granules of iron pigment, evidenced with Perl's staining.

33. . . . contain intracytoplasmic bile deposits, evidenced with Fouchet's reagent.

34. . . . contain unusually large amounts of intracytoplasmic deposits of lipofuscin, evidenced with periodic acid-Schiff (PAS) after diastase digestion.

35. . . . contain intracytoplasmic copper-binding protein deposits, evidenced with orcein staining.

36. . . . contain intracytoplasmic copper deposits, evidenced with rhodanin stain.

37. . . . contain PAS-positive intracytoplasmic globules.

38. . . . contain intracytoplasmic hyalin bodies (Mallory bodies) and megamitochondria.

39. Immunocytochemistry, performed with an anti-hepatitis B surface antigen antibody (clone and manufacturer are reported) is positive in the cytoplasm of . . . % of the hepatocytes.

40. Immunocytochemistry, performed with an anti-hepatitis B core antigen antibody (clone and manufacturer are reported) is positive in . . . % of the hepatocytes. Positivity is nuclear and cytoplasmic.

41. Immunocytochemistry, performed with an anti . . . antibody (clone and manufacturer are reported) is negative/positive in . . . % of the hepatocytes.

Diagnoses

42. Liver tissue devoid of pathological features.

43. Acute hepatitis.

44. Viral infection of the liver (type of virus is specified).

45. Minimal/mild/moderate/severe chronic hepatitis B/D/C.

46. Chronic viral hepatitis, not otherwise specified or type unknown.

47. Chronic hepatitis, unclassified as to viral or autoimmune origin.

48. Chronic drug hepatitis.

49. Autoimmune hepatitis.

50. . . . with mild/moderate/severe activity.

Table 1 Continued

51. . . . without fibrosis.
52. . . . with mild/moderate/severe fibrosis.
53. . . . with cirrhosis.
54. . . . (according to Desmet et al. [5])
55. Non-specific, reactive hepatitis.
56. Alcoholic hepatitis.
57. Granulomatous hepatitis.
( ) possibly of toxic nature.
58. Primary biliary cirrhosis.
Suggested staging:
( ) stage I.
( ) stage II.
( ) stage III.
( ) stage IV.
59. Secondary biliary cirrhosis.
60. Liver cirrhosis
( ) micronodular.
( ) macronodular.
( ) micro-macronodular.
61. Cholangitis
( ) acute suppurative.
( ) chronic.
62. Sclerosing cholangitis
( ) primary.
( ) secondary.
63. Cholangiolitis.
64. Hepatic siderosis, grade 1/2/3/4.

findings (such as iron deposits, hyalin globules, and so on), were also included in the list. The presence of stainable iron deposits is graded according to Sciot et al. [20].

In the second section of the checklist the most common diagnoses are offered. Terminology of chronic hepatitis follows the recommendations recently developed by an International Working Party [5, 7, 11] and reappraised by Schmid et al. [19]. Each diagnosis is coded according to the systematized nomenclature of medicine (SNOMED), 3rd edn [4], in order to allow retrieval of the cases from computerized archives [12]. In addition, some of the morphological features such as lobular involvement are also connected to the SNOMED code. The list contains, in addition, all variables useful to identify the patient, as suggested by the American Association of Directors of Anatomic and Surgical Pathology [1]. The copy of the report filed in the Pathology Department also shows the tabulated SNOMED codes applying to the specific diagnosis and/or descriptions.

The checklist has been included in the software (Pathware), in use in the Institute of Anatomic Pathology. During the diagnostic session the pathologist progressively checks each number (which corresponds to a computer code) relevant for the diagnosis and adds or outlines the proper information present in each code. This can be done with secretarial help on a paper print checklist, or the information can be introduced into the computer directly by the pathologist. With this system all of the needle biopsies seen in the institute in the last 12 months (486 cases) have been reported.

Some modifications were introduced on the basis of problems experienced during weekly meetings between pathologists and clinicians and also as a consequence of the recently modified classifications [5, 9, 11]. Specifically, the description of fibrosis and architectural distortion are added.

Discussion

In 1981 Knodell and colleagues [8] proposed a scoring system for assessing histological activity in chronic active hepatitis. This system can be considered one of the first attempts to standardize liver biopsy reports. Nevertheless these authors specifically addressed their study to asymptomatic chronic active hepatitis. In contrast the purpose of the present paper was to report a checklist which can be useful for everyday diagnostic work, in the most common liver diseases.

The use of checklists for histological reporting has been suggested as it provides numerous advantages which have been pointed out repeatedly [6, 7, 13, 21]. Among these we would like to emphasize the fact that a checklist is useful for the pathologist who examines the biopsy as a trace to evaluate all possible prognostically important features. It has been demonstrated [21] that experienced pathologists may omit important data in a given report. The use of a checklist overcomes this problem.

In addition a checklist is a time-saving tool in writing histological reports and avoids spelling mistakes. A possible source of error may lead to very serious transcriptional errors [13]. For example, it would be possible to enter 42 (liver tissue devoid of pathological features) instead of 43 (acute hepatitis), but this type of error should be avoided if the pathologist reads the final report carefully before signing it out. It is difficult to quantify time saving in secretarial procedures. All we can say is that our secretaries do not complain any longer about their workload since the introduction of the liver disease checklist or the checklists proposed by Rosai and collaborators [13]. Finally the use of a checklist has allowed the development of a common language within this hospital and among the three district hospitals which send their needle biopsies to this institution.

The negative aspects of using a checklist for histological reports have been listed in detail [13]. Among these the major criticism is focused on the fact that checklists do not entirely substitute for individual description which is needed in certain cases. However, the checklist was utilized in 472 of the 486 biopsies seen during the last 12 months (97% of the cases).

The aim of the present study was to report our experience with our current checklist for histological reporting on needle liver biopsies. The checklist is prepared on the basis of the daily practice of pathologists and clinicians involved in liver pathology at our hospital, following the well-accepted guidelines that have appeared in the literature. The list is directed towards the diagnosis of the most frequently encountered liver pathological conditions and constitutes the beginning of a new approach in diagnostic surgical pathology.

It is evident that the present checklist may be modified according to specific necessities and updated by introducing new data observed in the literature. In this respect it can be tailored to the specific experiences of any pathology department, constituting an incentive for con-

tinuous and active improvement in the diagnoses of hepatic disorders.

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