

—Original Article—

ALCOHOLIC HYALIN IN THE EXOCRINE CELLS OF THE PANCREAS

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Summary

In the past, appearance of alcoholic hyalin was reported to be confined to liver cells and pancreatic alcoholic hyalina have never been reported elsewhere.

The author examined the pancreas of about 100 autopsy cases of alcoholics and detected hyaline bodies in the exocrine cells of the pancreas in 9 cases. In addition to similar shape and stainability, these hyaline bodies were electron microscopically identical with alcoholic hyalin in the liver cells, and might be called alcoholic hyalin of exocrine cells of the pancreas.

Introduction

In 1901, F.B. Mallory¹⁾ found hyaline bodies with characteristic morphologic features around the nuclei of liver cells of heavy drinkers with liver cirrhosis. These hyaline bodies were thereafter called alcoholic hyalin and appeared only in the liver of heavy drinkers with rare exception. Consequently, they are considered to be one of the morphological characteristics of alcoholic liver damage.

In the past, these alcoholic hyalin were said to appear only in the liver cells of the heavy drinker and not in cells of other organs.²⁾ Recently, however, the author³⁾ found alcoholic hyalin not only in the liver cells but also in the exocrine cells of the pancreas in an autopsy case of florid cirrhosis. As the result of subsequent studies, alcoholic hyalin were noted in the pancreas in 9 cases so far.

The purpose of this paper is to present optical microscopic and electron microscopic findings of alcoholic hyalin in the exocrine cells of the pancreas.

Materials and Methods

One hundred autopsy case with the history of drinking more than 360ml of Japanese Sake (60 g of ethanol) daily comprise the substance of this study. The pancreatic tissues obtained from these cases was stained by phloxine methylene blue, Masson, and luxol fast blue in addition to ordinary staining. In 2 of 9 cases in which alcoholic hyalin were noted, fragments of the pancreatic tissues after formalin fixation were refixed for electron microscopic observation.

Results

1) Light Microscopic Findings:

The alcoholic hyalin seen in the exocrine cells of the pancreas have the same properties as those in the liver cell. They are small hyaline bodies located around the nuclei, arranged in irregular meshwork or staghornlike shape with eosinophilic properties, staining bright red by phloxine methylene blue stain, orange-brown by Masson stain, and deep blue by luxol fast blue stain (**Fig. 1.2**).

Alcoholic hyalin were noted in 9 cases (**Table 1**). All of these had a history of drinking for more than 10 years. There were 3 cases of sudden death due to dysentery or pancreatic necrosis (Cases 6-8). In 6 other cases a period without alcohol ingestion lasted for more than 1 month after admission. This period was as long as almost 1 year in 2 cases. In 7 of 9 cases, alcoholic hyalin were found both in the liver and pancreas. In 2 cases (Case 8, 9), they were noted only in the pancreas, and not in the liver.

As to the findings in the pancreas of these 9 cases, pancreatitis secondary to cancer of the pancreas was noted in Case 4. In Cases 7 and 8 with pancreatic necrosis, chronic relapsing pancreatitis was noted, and extensive hemorrhagic necrosis was noted as the final picture. In 6 other cases, atrophy and degeneration of the exocrine cells, derangement of the glandular structures and mild increase of intralobular connective tissue were noted. In some cases, mild neutrophilic infiltration and nuclear debris were noted. Alcoholic hyalin are frequently noted in the exocrine cells in the portions with marked degeneration and structural irregularity (**Fig. 3. 4.**).

2) Electron Microscopic Findings:

In 2 cases in which alcoholic hyalin were found rather abundantly (Cases 1,8) pancreatic tissue after formalin fixation was refixed for electronmicroscopic observation and emdded. **Figure 5** is the thick Epon sections stained with toluidine blue and **figure 6** is the thick Epon sections stained with Masson. After confirming the alcoholic hyalin in these sections, the cell was electron microscopically studied. **Figure 7** is Case 1 and **figure 8** is Case 8, both exhibiting fibrillar filamentous structure with parallel direction of fibrils. The width of the fibril was 175 Å (109-219Å) in Case 1, and 190 Å (65-379 Å) in Case 8.

Discussion

Alcoholic hyalin are said to be found only in the liver cell. No reports are yet available on the presence of these bodies in other organs. The author therefore made a histologic study on pancreatic tissue of alcoholics by employing the special staining method (phloxine methylene blue, Masson, and luxol fast blue) recommended for alcoholic hyalin. In the pancreatic exocrine cells of 9 cases, hyaline bodies with properties similar to those in the liver cells were demonstrated. Various theories were suggested on the origin of alcoholic hyalin. From the viewpoint of structure, various workers agree on the form of aggregates of fibrillar and filamentous material.⁴⁾ The hyaline bodies in the exocrine pancreatic cells demonstrated by the author also showed fibrillar or filamentous structure exactly like the alcoholic hyalin in the liver cells electron microscopically.

Alcohol abuse is a predominant cause of pancreatitis along with gallstones. A clinical entity of alcoholic pancreatitis^{5) 6)} is also suggested. However, morphological criterion for alcoholic pancreatitis was lacking up to present. Since the appearance of alcoholic hyalin in the pancreatic cell was established, presence

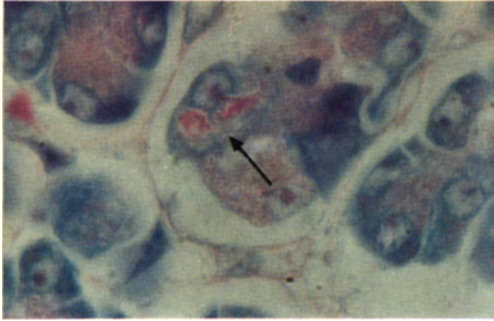


Fig 1 Light micrograph of alcoholic hyaline (arrow) in the exocrine cells (Case 5 phloxine methylene blue stain)

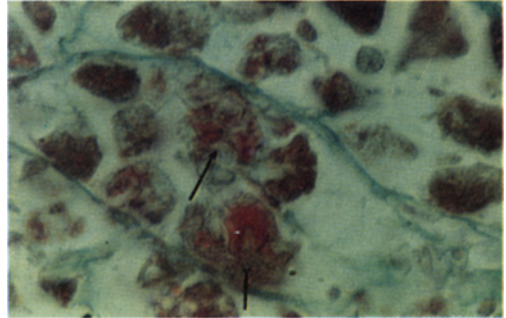


Fig 2 Light micrograph of alcoholic hyaline (arrows) in the exocrine cells (Case 1 Masson stain)

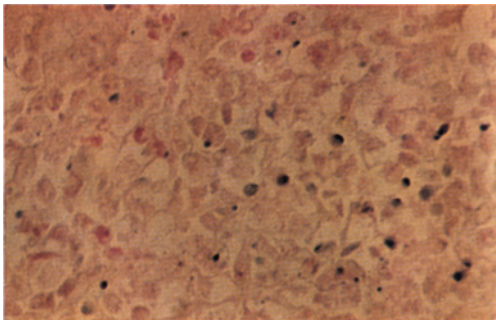


Fig 3 Alcoholic hyaline in the portion with marked degeneration and nuclear debris (Case 6 phloxine methylene blue stain)

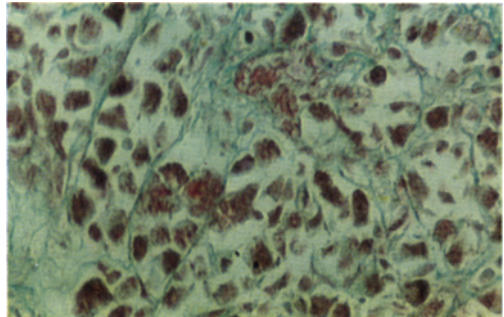


Fig 4 Alcoholic hyaline in the portion with intralobular fibrosis and structural irregularity (Case 1 Masson stain)

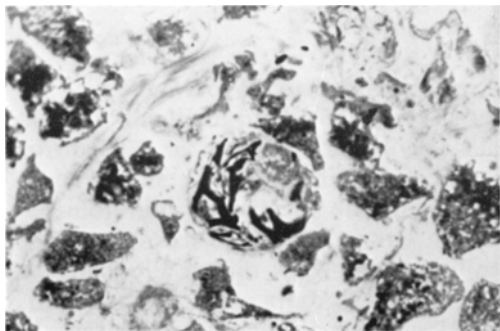


Fig 5 Alcoholic hyalin in the thick Epon sections stained with toluidine blue (Case 1).

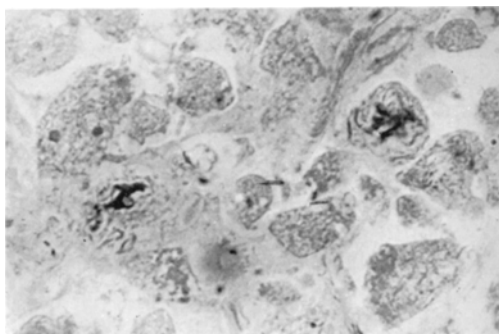


Fig. 6 Alcoholic hyalin in the thick Epon sections stained with phloxine methylene blue (Case 1)

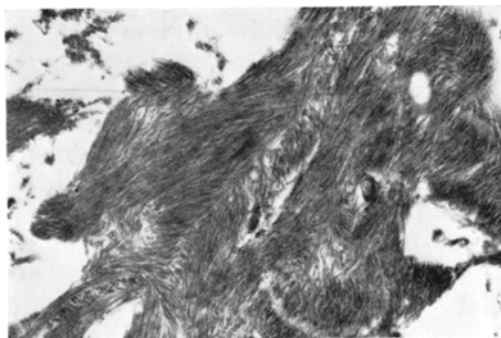


Fig 7 Electron micrograph of alcoholic hyalin showing characteristic fibrillar appearance (Case 1. x 30300)

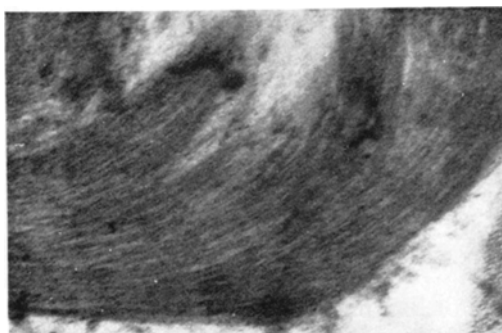


Fig 8 Electron micrograph of alcoholic hyalin showing characteristic fibrillar appearance (Case 8 x 94700)

Table 1

Case	Age	Sex	Autopsy diagnosis	Alcohol intake		Period without alcohol ingestion	Alcoholic hyalin		Histologic findings of the pancreas
				Dosage	Duration		Pancreas	Liver	
1	57	M	Florid cirrhosis Cerebral hemorrhage	##	40	1M	##	###	intralobular fibrosis disarrangement of acinar structure, degeneration of acinar cells
2	29	M	Cholangitic abscess of the liver	90-120	/	5M	##	+	degeneration of acinar cells with nuclear debris, disarrangement of acinar structure
3	46	M	Mesothelioma of the pleura	210-	25	14M	##	+	atrophy, degeneration of acinar cells, disarrangement of acinar structure
4	53	M	Carcinoma of the pancreas	60	30	11M	+	+	severe pancreatitis secondary to cancer of the pancreas
5	67	M	Carcinoma of the lung	##	45	3M	⊥	+	atrophy, degeneration of acinar cells, leucocytes infiltration
6	55	M	Dysentery	##	30	10D	⊥	⊥	disarrangement of acinar structure, nuclear debris
7	41	M	Chronic relapsing pancreatitis Recent hemorrhagic necrosis of the pancreas	90-120	20	3-4D	⊥	⊥	{inter-, intralobular fibrosis recent severe necrosis and hemorrhage
8	37	M							
9	71	M	Hepatoma	90	50	4M	⊥	-	mild intralobular fibrosis mild atrophy of acinar cells

of alcoholic hyalin must become the ground for the histological diagnosis of alcoholic pancreatitis. This should also provide a reliable index for the production of alcoholic pancreatitis in animals.

References

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