Heterotopic Splenic Tissue in the Liver of a Swine

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ABSTRACT. A heterotopic splenic tissue (HST) was observed in the diaphragmatic face of the right hepatic lobe of a 6-month-old, female mixed bred swine. Macroscopically, HST was a solitary, well-demarcated intrahepatic nodule, 1 × 0.5 × 0.5 cm in size. Other organs including original spleen showed no macropathological abnormalities. Histological findings of HST were essentially similar to those of the original spleen, receiving feeding blood vessels from hepatic portal vein. To our knowledge, the present case is the first report of HST in the liver not only of domestic animals but also of man.—KEY WORDS: choristoma, spleen, swine.

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The terms, choristoma, heterotopia, heterotopic or displaced tissues, or aberrant rest have been applied to the pathologic condition of microscopically normal tissue on the abnormal location [2]. Heterotopic tissue is supposed to be rare in domestic animals, however it has been reported [2]. We present the first report of heterotopic splenic tissue (HST) located within the hepatic parenchyma of a swine.

The case was a 6-month old, female mixed bred swine. At routine meat inspection, a solitary intrahepatic nodule, approximately 1 × 0.5 × 0.5 cm in size was detected in the diaphragmatic face of the right hepatic lobe. The nodule was much more dark-reddish and firmer than the surrounding liver, showing clear demarcation. On cut-surface, round to elongated gray spots, less than 3 mm in diameter were seen to be uniformly distributed throughout the red mass. Other organs including original spleen showed no gross abnormalities.

Microscopically, the nodule was embedded in the hepatic parenchyma, although was continuous with hepatic capsule. Its border was well-demarcated by the thin fibrous tissue (Fig. 1A). Adjacent hepatic tissue was slightly compressed, and showed normal histologic features without hemorrhage or inflammatory changes. The nodule seemed to be splenic tissue, composed of white and red pulps in association with trabeculae, including reticulin framework. In particular, some histologic characteristics of the swine spleen [1] were well preserved, such as 1) presence of capsule entirely composed of the smooth muscle cells, 2) abundant lymphoid follicles and periarterial lymphoid sheaths of the white pulp, and 3) well-developed perifollicular ellipsoid tissues with scattered smooth muscle cells and splenic sinuses of the red pulp (2) and 3) were included in Fig. 2). However, some differences were noticed in histologic architectures, in comparison with the original spleen and spleens from other normal

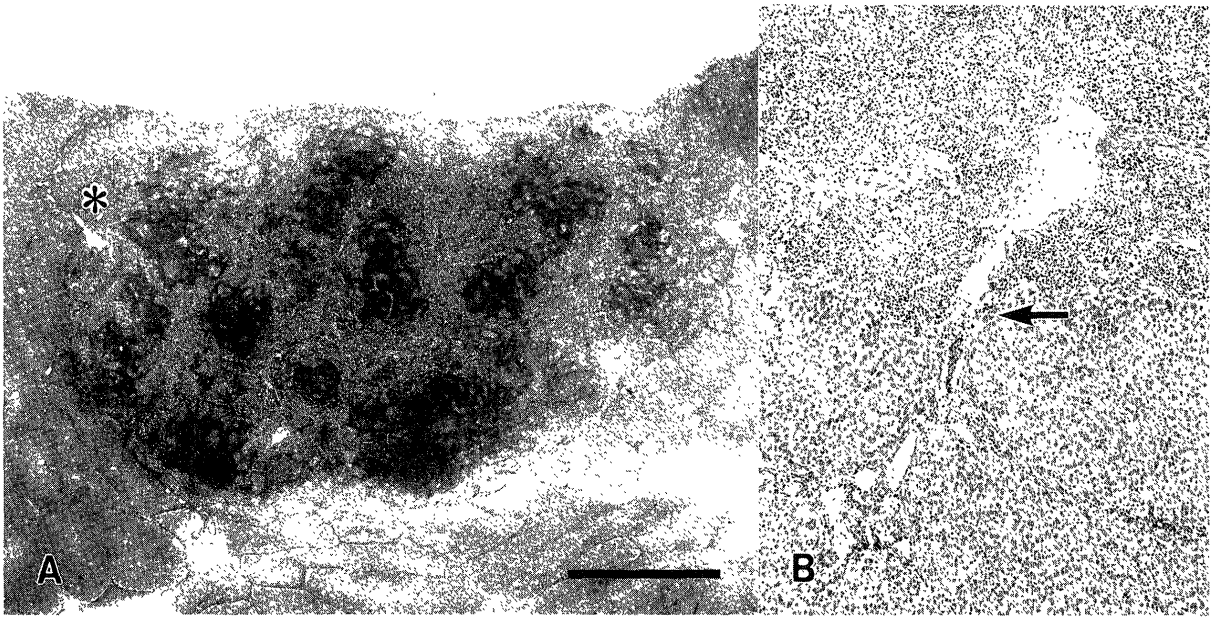

Fig. 1. A: Low power view of the well-demarcated intrahepatic heterotopic splenic tissue, supplemented with a hepatic vasculature (asterisk). Note numerous white pulp. HE. Bar = 0.2 cm. B: Higher magnification of the part of asterisk in Fig. 1A, showing the direct connection of a portal vein (arrow) with an intratrabecular vein of heterotopic splenic tissue. HE. × 50.

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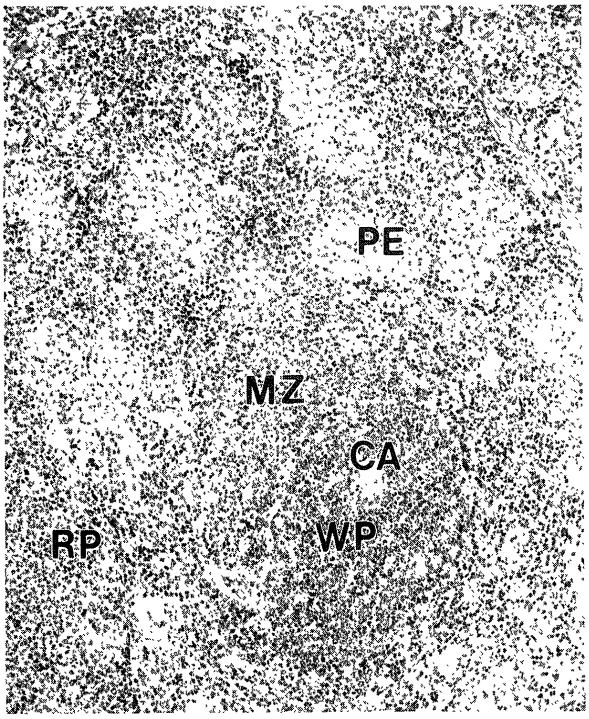

Fig. 2. A white pulp of the heterotopic splenic tissue, revealing quite similar histological features to the normal spleen. CA: a central artery, WP: a white pulp, MZ: a marginal zone, PE: perifollicular ellipsoid tissues, and RP: red pulp.

swine. Capsule and trabeculae of HST were discontinuous, and irregular in thickness, and then, marginal zone between the lymphatic nodule and the red pulp was apparent (Fig. 2). Step sections revealed that some branches of hepatic portal vein were directly connected with the intratrabecular vein of heterotopic splenic tissue (Fig. 1B).

HST is usually subdivided into accessory spleen (called also spleniculus or splenic exclave) and splenosis by its cause; the former is congenital malformation in nature and the latter is acquired, mostly developed due to traumatic injury [3, 7]. Splenosis rarely manifests clinical significance and is usually found as an incidental finding at autopsy or surgery of abdomen or vagina, but is most frequently observed after a traumatic injury [7]. The present case had no evidence of trauma. Especially, in human beings, to distinguish this from accessory spleen, there have been some criteria. Microscopically, accessory spleen is just like normal spleen, i.e., possessing normal hilus, capsule, and parenchyma. On the other hand, splenosis varying in shape, has no hilus and poorly-defined capsule. Accessory spleen, regardless of location, is always supplied by a branch of the splenic artery [6, 7], but not by a hepatic portal vein like in the present case. Splenic implants may be located anywhere within the peritoneal cavity. As for the location, HST has been reported in the left flank, epigastrium, mid abdomen, pelvis, scrotum, pancreas, and stomach [4, 7]. In most of the reported cases, HST attached to the supraparenchymal position, whereas interestingly the present case is entirely embedded in the hepatic parenchyma. Similar case has not been described yet in the literature. Finally, on the basis of aforementioned findings, pathological characteristics of the case could not apply exactly to the entity either accessory spleen or splenosis, thereby we diagnosed this case as HST in the liver of a swine in wide sense.

The origin of HST was obscure, however some investigators suggested that HST is the result of implantation of splenic primordial germ cells during fetal development [2] or the result of an early arrest of splenic development or of a simultaneous development of splenic tissue from several anlagen [3].

In conclusion, this is the first case, described HST in histological comparison with normal splenic tissues in the literature. Further studies are needed to clarify this unusual condition.

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