results indicate that the anti-testis serum contains antibodies which can stain germinal cells and other components of the testis as well as sperm (Table I). The components are not common to other human tissues such as liver, kidney, adrenal, and spleen since antibodies capable of staining these tissues were removed by absorption with human liver. The anti-sperm and anti-seminal fluid could only stain sperm and spermatocytes.

Actually the anti-seminal fluid serum did not appear to contain antibodies directed against human connective tissues even before absorption with human liver. On the other hand, both anti-sperm and anti-testis antisera did contain such antibodies since they stained liver sinusoids and basement membrane elements of the kidney of the normal human tissues. In these latter studies absorption was performed with rat liver to remove non-specific staining components. Weil *et al.*(3,5) have studied rabbit anti-human seminal fluid and anti-human spermatozoa sera. They found that both antisera appear to react identically with seminal fluid and with sperm by complement fixation, sperm cell agglutination, precipitation tanned cells agglutination and agar diffusion methods.

Lack of staining of tumor tissues. Although the anti-testis sera appeared to show some affinity for adult testicular epithelium, staining of testicular tumors was negative. Studies on 4 seminomas, 3 embryonal carcinomas, 2 chorioepitheliomas and one mixed tumor (a malignant teratoma with embryonal carcinoma and seminoma) were made. None of the tissues were stained by anti-testis antiserum nor with the anti-sperm or anti-seminal fluid sera.

These results show that there are components unique in testis which can be stained with antibody against testis, seminal fluid and sperm but these components were not present at a concentration high enough to be observed in the several testicular tumors tested (Table I).

Summary. The fluorescent antibody technic was employed to determine the presence of normal antigens of sperm, seminal fluid, and testis in various testicular tumors. Ten testicular tumors showed no staining with any of the antisera made to the above normal antigens. These results show that there are components unique in testis which can be stained with antibody against testis, seminal fluid and sperm but these components were not present in the several testicular tumors tested at a concentration high enough to be observed. Some differences were noted between the anti-seminal fluid, anti-sperm and anti-testis sera. The 3 sera reacted with sperm cells. Anti-sperm and anti-testis in addition to staining sperm cells reacted with stromal elements in testis. The latter serum also contained antibodies to germinal epithelium.

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Effect of Partial Hepatectomy on Autologous Tail Tendon Implanted in the Rat Liver.* (27838)

IRMGARD MONTFORT AND RUY PÉREZ-TAMAYO (Introduced by Hans Popper)
Unidad de Patologia, Facultad de Medicina, Universidad Nacional Autonoma de Mexico, Mexico City

The ability of the liver to absorb collagen has been demonstrated in two experimental situations(1): first, in cirrhosis of the liver induced in the rat by CCl_4(2,3), "butter yellow"(4), and various diets(5), and second, by implantation of catgut and homologous

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collagen(6), into the normal rat liver. In animals with CCl_4-induced cirrhosis, which is no more spontaneously reversible after discontinuation of the CCl_4, administration, partial hepatectomy induces regeneration of normal parenchyma and regression of fibrous tissue(7,8,9). Similarly implanted catgut and the surrounding fibrous capsule disappear within approximately 2 months. In contrast, implanted homologous rat tendon persists for at least 2 months and stimulates the development of a narrow capsule of vascularized connective tissue(6). The different fate of fibrous tissue in cirrhotic liver and of collagenous implants in normal organ might result either from the diverse nature of the material to be reabsorbed or from the presence of hepatic regeneration. It seemed therefore pertinent to explore the fate of autologous tendon implanted into the rat liver undergoing regeneration after partial hepatectomy.

Material and methods. Albino rats of Wistar strain, weighing 85-146 g, were kept in groups of 4 in metal cages and fed a commercial preparation and water *ad libitum*. Autologous tail tendon was obtained(10) from each animal and immediately the right lobe of the liver was exposed by a mid-line laparotomy and the tendon inserted through it by entering and emerging at the dome with a thin atraumatic needle; the tendon was trimmed to the surface at both emerging points. Subsequently a partial hepatectomy was performed in 24 rats according to Higgins and Anderson(11). The liver lobes removed were weighed. Regeneration was calculated as previously described(12); the amount removed at partial hepatectomy was 61.6% of total liver weight in 11 animals of the same group which died during or shortly after hepatectomy. As controls, 15 rats received implants without subsequent partial hepatectomy. The experimental animals in groups of 4 and the control animals in groups of 2 or 3 rats were sacrificed at 7, 14, 21, 28, 35 and 91 days after operation. The liver was weighed and the entire right lobe was blocked and fixed in 10% formalin. Paraffin sections were cut at 10μ and stained with hematoxylin and eosin, Foote's silver impregnation and von Kossa's method for calcium.

Results. Regeneration of the liver in the experimental group followed a normal pattern, being fairly complete in most animals at 7 days. Histologic changes in implanted autologous tendons were essentially similar in both groups. At 7 days after implantation the tendon bundles appeared slightly fragmented in some areas but were essentially normal in others. Fragmented collagen bundles showed a bluish tinge with hematoxylin and eosin caused by calcium as seen with the von Kossa stain. The tendon was surrounded by a thin capsule of fibrous connective tissue composed of only few layers of thin collagen fibers and reticulum, and scarce fibroblasts (Fig. 1 A). At 14, 21 and 28 days after implantation the tendons looked alike except that fragmentation and calcification were more intense. Some foreign body giant cells were usually related to calcium. At 35 and 91 days after insertion the tendon was almost entirely calcified (Fig. 1 B). The connective tissue capsule was somewhat thinner. At no time were cells seen to penetrate the tendon and the surrounding hepatic structures remained unaltered. The slightly greater intensity of the changes in the tendon at 7 than at 91 days after implantation could be explained by the focal nature of fragmentation and calcification of collagen bundles.

Discussion. Regeneration of the liver after partial hepatectomy exerts no influence upon the fate of autologous tail tendon implanted into the liver of rats. Also Marconi(13), who implanted catgut and kangaroo tail tendon into the liver of partially hepatectomized and non-hepatectomized rats, found no influence of the process of regeneration histologically within 7 to 24 days. These results as well as those reported here in which autologous material was used contrast sharply with the capacity of the cirrhotic liver to reabsorb connective tissue. Apparently the factor determining reabsorption of connective tissue within the liver is the nature of the material to be reabsorbed. Thus, catgut, the capsule surrounding it, and the connective tissue formed *in situ* during development of cirrhosis can be reabsorbed, while

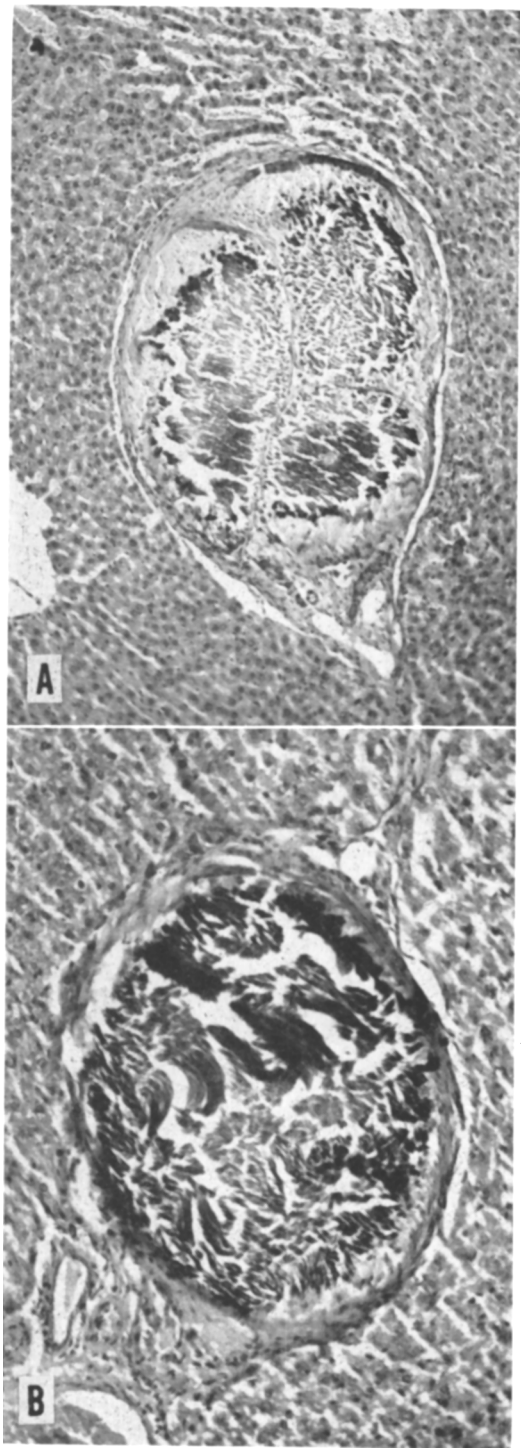

FIG. 1. A. Autologous tail tendon 7 days after implantation into a liver undergoing regeneration. A thin capsule of connective tissue surrounds the collagen bundles which are fragmented and calcified. 192 ×. B. Autologous tail tendon 91 days after implantation into the regenerating liver. Hematoxylin and eosin, 280 ×.

heterologous (kangaroo), homologous, and autologous tail tendon are not. Furthermore, the fibrogenic stimulus appears to determine the fate of the surrounding connective tissue capsule as well, since the capsule surrounding catgut is reabsorbed while that enveloping other collagenous implants is not.

Summary. Autologous tail tendon was implanted into the liver of rats to study the influence of regeneration after partial hepatectomy on the fate of the collagenous implant. In both partially hepatectomized and non-hepatectomized animals the tendon was equally encapsulated, calcified and stimulated a foreign body reaction. Both surrounding capsule and tendon were present at the end of 91 days.

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