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Liver tissues regenerated from human tooth treats liver failure of rat cirrhosis model and swine NASH model

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Cadaveric or live-donor liver transplant is only the treatment for severe liver condition. However, the number of transplantations is very limited because of fewer available organs than number of the patients on the waiting list. The liver regeneration might be one of the alternatives. Several clinical studies employed mesenchymal stem cells from blood, adipose tissue or others to transplant without differentiating the cells. However, transplantation of these cells can only slow decline of hepatic function, but they cannot treat the conditions of the liver. The objective of adult stem cell transplantations might be to launch “bridge to transplant” strategy rather than treating liver condition. We have shown that human dental pulp stem cell demonstrates huge potential to treat lethal liver conditions. We have previously reported we treated the biliary liver cirrhosis and acute liver injury in nude rats with transplanting the regenerated liver tissues originated from human dental pulp. One of the most

prevailing liver conditions is non-alcoholic steatohepatitis (NASH). Hence the objectives of the research are to evaluate the clinical possibility of our transplantation protocols using swine model of progressive liver failure developed from NASH. After four weeks of transplantation of hepatocytes described from human tooth into the spleen of 6 swine with the failure under immune suppression, we found the secondary liver in the spleen was produced, as well the regenerated liver was produced using the original liver as scaffold. Biliary ducts are reproduced with human tissues only 4 weeks after the transplantation. Serum albumin level recovered from 1.5 g/dL to over 3.0 g/dL. HPT, choline esterase, collagen type IV, ALT and others have been dramatically improved. But any of the positive control has shown no change. Following above we also treated rat cirrhosis model.

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