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Establishment of a Personalized Treatment Model for Intraductal Papillary Mucinous Neoplasm of the Pancreas

Fach/Einrichtung: Chirurgie

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Pancreatic ductal adenocarcinoma (PDA) is one of the most lethal malignancies. In order to early detect and treat PDA, researchers pay much attention on the precursor lesions of PDA. It is clear that Intraductal papillary mucinous neoplasm (IPMN) as one of precursor lesions is able to progress to invasive PDA. And most of current studies about IPMN focus on biological markers or gene mutations to predict prognosis. However, an easy, fast, non-expensive personalized animal model for studying freshly resected patient IPMN tissues is still absent. In my present study, I evaluated the consistent xenotransplantation of freshly resected IPMN tissues to the chorioallantoic membrane (CAM) of the chick embryo as an alternative to mammalian models. 41 patient IPMN tissues were transplanted to egg model including (low-grade dysplasia IPMNs n=15, intermediate-grade dysplasia IPMNs n=16 and high-grade dysplasia IPMNs n=10). A significant difference between the engraftment efficiency of malignant IPMN and benign IPMN was observed, with 90% and 40% respectively. According to mucinous expression, 41 patients were sub-classified in to 3 groups (gastric and intestinal subtype n=9, oncocytic subtype n=17, panreatobiliary subtype n=14). Engraftment efficiency of panreatobiliary subtype IPMN was prominently higher than gastric and intestinal subtype. Expression of different mucins was also preserved in following passages. Furthermore, several cancer stem cell markers and pancreatic ductal markers were maintained in following passages compared to primary tumor. In some malignant IPMN cases, long-term sub-transplantation may induce GEM resistance associated with expression of CSC markers. Therefore, I conclude that reasonable using of fertilized chick egg model could predict prognosis and perform drug screening for individual IPMN patients with malignant potential.