Liver regeneration after portal vein plus hepatic artery ligation performed heterochronously

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Abstract

Background /Purpose: portal vein ligation (PVL) has been used clinically to decrease the amount of liver before surgical resection, consequently, minimizing postoperative dysfunction in the remaining hypertrophied liver lobes. To date, few reports in the literature have demonstrated the regenerative capacity of unaffected lobes following PVL plus hepatic artery ligation (HAL). This study was conducted in dogs to determine a safe and efficacious method of PVL plus HAL, focusing on liver functions and NF kappa B (P105) labeling index.

Methods: group I: control group, where laparotomy was performed without ligation. Group II dogs were subjected to PVL of the right lateral and median branches alone (corresponding to approximately 50% total liver volume). In group III, we performed PVL and HAL of the same branches simultaneously, while in group IV, HAL was performed 48h after PVL. Dogs from each group were biopsed at 24, 48, 72, 96, and 168h after surgery. Standard serum liver functions were tested, proliferative activity in the non-ligated liver was expressed using the NF kappa B (P105) labeling index.

Results: induction of the NF kappa B (P105) labeling index showed maximum levels in group IV. However, quantitative determination of serum glutamicoxaloacetate transamininase (GOT) showed peak levels in group III at 24h after surgery.

Conclusions: from these results, we conclude that the PVL plus HAL heterochronous procedure is safer and more effective than PVL only. Or simultaneous PVL plus HAL. A better knowledge of the events following such heterochronous ligation should improve the clinical outcome of hepatic resection for liver diseases.

Keywords

Portal vein ligation, Hepatic artery ligation, Liver regeneration, NF kappa B (P105),