World Journal of Gastroenterology

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DOI: 10.3748/wjg.v6.iSuppl3.22

World J Gastroenterol 2000 September 15; 6(Suppl 3): 22
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

Quality control of PSE and the study of portal hemodynamics changes after PSE

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Received: April 3, 2000
Revised: June 3, 2000
Accepted: June 28, 2000
Published online: September 15, 2000

Abstract

AIM: To explore a method to control splenic embolic volume precisely for partial splenic embolization (PSE) to improve the validity and safety of PSE, and study the portal hemodynamic changes after PSE.

METHODS: Gelfoam particles of identical standard (2 × 2 × 1.6 mm) were used as embolic material to measure the splenic radiographic parameters SAI (spleen activity index) was measured scanning with radioisotope technetium-^{99m}Tc sulfur colloid and splenic embolic volume was calculated with the following formula: splenic embolic volume = [SAI (pre-PSE) - SAI (post-PSE)]/SAI (pre-PSE) × 100%. The regression equation of gelfoam particles in splenic embolic volume and splenic radiographic parameters was calculated using SAS (statistical analysis system) software (version 6.02). Portal hemodynamic changes were examined by color Doppler ultrasound.

RESULTS: The amount of gelfoam particles was correlated with splenic embolic volume and top bottom length of spleen, regression equation was achieved: $Y = 5.77X_1 + 15.19X_3 - 164.75$, (multi-regression was used, significant level $P = 0.15$). Y: number of gelfoam particles used, X_1: splenic embolic volume (%), X_3: top-bottom length of spleen (cm). The diameter and blood flow volume of spleen and portal vein and the peak velocity of spleen vein all decreased after PSE. The decreased parameters were positively correlated with splenic embolic volume.

CONCLUSION: By calculating gelfoam particles for PSE, splenic embolic volume could be controlled within the effective and safe limit. PSE could decrease the high dynamic circulating state of portal system effectively.

Key words: Spleen/radionuclide imaging; Partial splenic embolization; Embolization, therapeutic; Hemodynamics; Ultrasonics; Quality control; Gelatin sponge, absorbable; Portal system

Cui J, Han MJ, Ren K, Xu K. Quality control of PSE and the study of portal hemodynamics changes after PSE. *World J Gastroenterology* 2000; 6(Suppl 3): 22 Available from: URL: http://www.wjgnet.com/1007-9327/full/v3/iSuppl3/22.htm DOI: http://dx.doi.org/10.3748/wjg.v3.iSuppl3.22

E- Editor: Hu S

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