Efficacy and safeness of polyglycolic acid felt sealant with fibrin glue at the liver cut surface for prevention of postoperative bile leakage in laparoscopic liver resection

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Background

Bile duct injury and bile leakage often occur in extensive liver resection.
Repairing of bile duct injury is complicated techniques in laparoscopic liver resection (LLR) especially, so TachoSil® is wide-spreadly used for prevention of bile leakage on liver cut surface.
Recently the effect of Fibrin Sealant with Polyglycolic Acid Felt was reported on open hepatectomies.

Aim

We previously investigated on the safety method using polyglycolic acid felt sealant (NEOVEIL sheet®) with fibrin glue (PGA methods) at the liver cut surface for prevention of postoperative bile leakage in liver resection.
We aimed to investigate the efficacy of PGA sealant for prevention of bile leakage after LLR compared with conventional method.

Methods

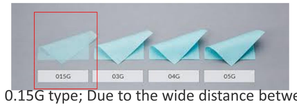
Jan,. 2008～Dec. 2021
580: Pure laparoscopic liver resection (LLR)

PGA group 16
Jan. 2019～ Dec. 2021
Cutting depth over 5cm
LLR **Reinforced transected surface With PGA Felt and Fibrin glue**

Matched &Compared

Control group 28
Jan. 2016～ Dec. 2018
Cutting depth over 5cm
LLR **without preventional procedure**

PGA Methods





0.15G type; Due to the wide distance between fibers, fibrin glue penetrates well.

(1) Drop 1 mL of fibrin solution of bio-glue on the cut surface, and then apply 1 mL of thrombin solution to the same site.

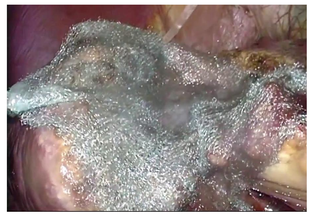
(2) Apply NV (0.15 G) soaked in 1 mL of fibrin solution to the cutting surface.

(3) Apply 1 mL thrombin solution to NV site and react.

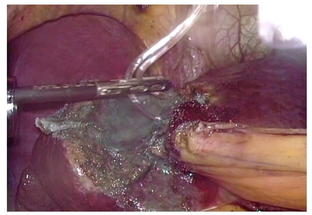
(4)Drop the remaining fibrin solution and thrombin solution.



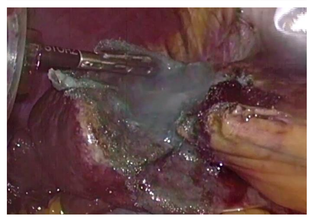
(1) Drop 1 mL of fibrin solution of bio-glue on the cut surface, and then apply 1 mL of thrombin solution to the same site.



(2) Apply NV (0.15 mm) soaked in 1 mL of fibrin solution to the cutting surface.



(3) Apply 1 mL thrombin solution to NV site and react.



(4)Drop the remaining fibrin solution and thrombin solution.

Patients Background

	PGA group (n=16)	Control (n=28)	
Age	71.5 (47-86)	71.5 (33-86)	n.s.
Gender (M/F)	10 / 6	20 / 8	n.s.
BMI	22.7 (15.8-36.1)	23.6 (19.9-33.3)	n.s.
Diagnosis (HCC/Mets/ICC)	10 / 5 / 1	20 / 6 / 2	n.s.
Tumor size(cm)	3.6 (1.2-6.5)	2.2(0.8-7.5)	n.s.
ASA	2 (1-3)	2(1-3)	n.s.
Child Pugh score	5(5-6)	5 (5-8)	n.s.
Procedure (Hr0/Hr1/Hr2)	2 / 13 / 1	25 / 2 / 1	0.0249

Results

	PGA group (n=16)	Control (n=28)	
Op. duration (min)	202 (95-294)	120(47-242)	n.s.
Blood loss(ml)	83 (0-985)	30(0-1270)	n.s.
Intraop. bile leakage	3	4	n.s.
Bile leakage	0	2	n.s.
Complication	0	2	n.s.
Stay(day)	7.5 (5-21)	8.5(3-18)	n.s.

Complication : Clavien-Dindo Classificatio>III excluded bile leakage

Discussion

By infiltrating fibrin glue before applying PGA sheet, it was easy to attach it to the cutting liver surface on laparoscopic surgery.

In PGA group, it had more subsegmental resections with high invasiveness and a large incision, but had similar complication rates and length of hospital stay compared with the control group.

PGA method did not cause bile leakage what required postoperative treatment even in intraoperative bile leakage cases.

Conclusion

Sheeling the Polyglycolic acid felt sealant with fibrin glue at the liver cut surface in LLR is easy handling and safeness.

This technique may suppress postoperative bile leakage which requires invasive treatment.