ソフト凝固における生理食塩液滴下の効果

株式会社アムコ技術部
古田 真也 海老塚 稔
川端 信希 橘 内 和 也

株式会社アムコ企画部
林 照 夫

埼玉医科大学国際医療センター 消化器外科
小 山 勇

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Effect of Instillation of Physiological Saline in SOFT Coagulation

Shinya Furuta*, Minoru Ebizuka*, Shinki Kawabata*, Kazuya Kitanai*, Teruo Hayashi*, Isamu Koyama**.

Abstract

Recently, the coagulation method instilling saline on active electrodes of electrosurgical generators with SOFT Coagulation has been used. This study verified what change this method brings.

Followings were used: VIO300D(ERBE) / electrosurgical generator, EIP2(ERBE) / irrigation pump, ball-type IO-advance electrode / active electrode, physiological saline, and porcine liver. Output mode was SOFT Coagulation (80W/E5), with the activation time of 3, 6, 9, and 12 seconds for with/without saline instillation. Saline instillation rate was set to one drop (0.05ml) per one second. The output was repeated 5 times respectively, and the mean values of diameter and depth were calculated from the obtained data.

In each output time, without instillation, mean coagulation diameters were 7.4/8.8/9.6/9.6mm and mean depths were 1.2/2.3/2.4/2.6mm. In output time of 9 seconds or longer, tissue adherence on the electrode was observed with little difference in coagulation diameter and depth. With instillation, mean coagulation diameters were 1.6/12.2/14.0/16.4mm, and mean depths were 0.3/2.5/3.6/7.0mm without tissue adherence.

Without instillation, as tissue coagulation progresses, resistance value is increased. Therefore, even in long time output, variation of diameter and depth becomes limited. Whereas, with instillation, the diameter and depth are increased due to the broadened range of current flow.

1. 目的

従来の電気手術器の凝固モードは、高い電圧によって生じる放電により組織表面を焼く。これに対しソフト凝固は、低い電圧でスパーカを発生させずにジェール熱のみで組織の脱水・乾燥をおこなう（図1）。放電による凝固に比べ、組織が炭化しない、スパークによる血管や組織の破綻が起こらない1)などの利点があり、電気凝固の新しい形として近年頻用されている。

最近、このソフト凝固モードを使用しながら電気手術器のアクティブ電極に生理食塩液を滴下する凝固法が、肝切除2)3)や腎部分切除4)な