

Measurement of Tissue Conductivity During Electrosurgical Vaporization of the Prostate.

邱文祥

Chiu;Allen W.;;Chang;Luke

S.;;Shieh;Y-Houng.;;Chu;Chun-Lien.;;Young;Shuenn-T

song

摘要

Abstract

Division of Urology, Department of Surgery, Chi-Mei Foundation Hospital, Tainan, Taiwan. Department of Urology*, National Yang-Ming University, School of Medicine Institute of Biomedical Engineering**, Shu-Tien Urological Research Center***, National Yang-Ming University, Taipei, Taiwan, R.O.C.

An experimental model established by the authors has documented that different tissue conductivity was generated when the traditional cutting loop contacted the prostatic adenoma and capsule. Recently the electrosurgical vaporization technology was used to treat benign prostatic hyperplasia. High temperature generated on the surface of the grooved silver nickel electrodes enables direct vaporization of the prostate. The authors thereafter attempted to measure different tissue conductivity during electrosurgical vaporization of prostatic tissues.

This study was composed of two parts, in-vitro pork and in-vivo canine experiments. The first part of the study utilized a block of pork to measure the tissue conductivity when the vaporizing electrode with different power (150W, 220W and 280W) contacted skin, subcutaneous fatty and meat respectively. The results showed that subcutaneous fatty tissue, (like periprostatic fatty tissue) generated the lowest conductivity because of its highest tissue resistance. The meat (like prostatic adenoma) has the highest conductivity, and the skin (like prostatic capsule) has conductivity in between. These differences all showed statistical significance. The second part of the study enrolled ten mature male dogs weighted 30 - 40 kgs to measure tissue conductivity when the electrode contacted different prostatic tissues at the power of 220W. Output signals on urethra mucosa was 0.799 ± 0.304 Ampere(A), on prostatic tissue was 0.924 ± 0.337 A, on prostatic capsule was

0.805 ± 0.401A, on periprostatic fatty tissue was 0.686 ± 0.332A, all P values were less than 0.05 (paired t-test). It appeared the periprostatic fatty tissue has the lowest tissue conductivity followed by the prostatic capsule and the prostatic adenoma. (J Urol R.O.C., 11:56-62, 2000)