CARBON COATED TWO DIMENSIONAL LASER BEAM BARCODEENGRAVINGONMETALSURGICALTOOLSSHOWE BETTER ENDURANCE AGAINST SCRATCHING LESIONS

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Introduction: For the cost effective and automated on-site preparation with less man workloads on recycling process of metal made surgical instruments such as scalpel, forceps etc,asystemic approach ofmanaging individual suchtools by barcode marking is desirable. One dimensional line- barcode is widely used in medical areas of marking market, however its limited coding capacity per length becomes the limitation in the application of marking on small surface area of surgical tools. In addition to this limitation, the scratch proof hardness of in-printed marks become crucial in the recycle process from surgical use to machine washing, rapid drying and high temperature and high pressure autoclave sterilization.

Methods: Two dimensional barcode which includes 25 character-information wasdirectlyengraved byLaser light on 3 by 3 mm square area on the surface of each carbon coated metal surgical instrument. Four sets of surgical container, general surgery one(GN), gastric resection one(GR), obstetrics and genecology one(OG), and Cae-sarian surgery one(CN), each set includes 107, 5, 71, 51 surgical instruments respectively, were prepared. These sets are used for set specific surgeries for half year period and the required time to complete barcode reading of each instrument by the scanner (TOHKEN THIR-3000DM) was recorded. This reading process was done just after disinfection-cycle ended on post operation period by two staff nurses (nurse-A,B) for excluding variations brought by their skill differences. We have statistically analyzed the correlation coefficients between the required time to read barcode vs. recycled process times by Fisher's Z transformation. Positive relation ($P<0.05$) was defined as statistical significant on their comparisons.

Results: Total of 38 recycled processes for all four setswere evaluated. Correlation coefficients (R) between re-quired reading time for each metal instrument vs. times of processed cycle were -0.453 ($p<0.167$), -0.323 ($p<0.315$), -0.239 ($p<0.419$), -0.417 ($p<0.277$) for GN,GR, OG, CN set respectively for nurse-A and 0.038 ($p<0.904$), -0.565 ($p<0.0432$), -0.040 ($p<0.905$),-0.342 ($p<0.260$) for GN,GR, OG, CN set respectively for nurse-B. None of correlation coefficients showed significant positive relation. There was nothing unable to read barcode by the scanner in all readingprocedures.

Discussion: Smita et al. [1] reported the positive significant relations were existed between barcode scanning time and times from surgical use to sterilization recycledprocess of surgical metal instruments and five percents of such instruments were failed to read their barcodes. The test period and times of recycled process both in ours and theirs are same but our results showed no significant positive coefficients and no failure rate in scanning process. We think their no carbon coated two dimensional1 barcode engraving and our carbon coated one made such differences in resistance properties against scratching lesions on the barcode surface. Finally we would like to conclude that carbon coated two dimensional Laser beam barcode engraving on metal surgical tools showed higher endurance against scratching lesions.

REFERENCE

1. Sumita M et al: Journal of the Japanese Association for Operative Medicine 2003;24:314–316