PE03 Detailed examination of the efficacy, efficiency and cost of robotic versus assistant applied clips in robotic assisted radical prostatectomy (RARP)

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Introduction & Objectives: Although robotic assisted surgery offers a multitude of advantages to the surgeon, unique challenges are presented to the surgeon in robotic surgery which are not found in other types of surgery. One of these is that the application of haemostatic self locking clips is usually performed by the bed side assistant, who have to apply the clips independent of the console surgeon. This can be challenging to the bed-side assistant who may have limited laparoscopic experience. This may be especially more pronounced in training institutions that have a constant turnover of surgical trainees as assistants. Added to this, the lack of articulation of the assistant's clip applicator instrument can lead to difficulty in accurate clip application, and the dropping and loss of clips in the abdominal cavity. This leads to surgeon frustration, potential inaccuracy in surgical technique, increased operating times and also has the potential for inefficient clip usage with a subsequent financial consequence, and the potential for dropped clips becoming lost in the abdominal cavity. The daVinci Xi® system (Intuitive Surgical®, USA) allows application of clips under direct control of the console surgeon. This study aims to compare the efficacy, efficiency and cost-effectiveness of both techniques in RARP.

Materials & Methods: Retrospective review of twenty operative videos of RARP cases performed by a single surgeon (DBH) and one of 4 experienced robotic theatre acting as scrub nurse were divided into two groups; Group 1 being robotically applied clips and Group 2 being manually applied clips (applied by one of two experienced robotic fellows). Unique redistribution of operating instruments was utilized to maximize robotic clip application efficiency. The assistant is on the left side, with a Maryland forceps in arm 1, camera in arm 2, scissors in arm 3 and Prograsp forceps in arm 4. For robotically applied clips, the Prograsp is removed from arm 4, and scissors is replaced into arm 4. The robotic clip applicator is then inserted and removed via arm 3, as this is a much safer route to facilitate multiple re-entries for the robotic clip applicator, whilst leaving the scissors in situ to allow for efficient division of tissue with the scissors. Review of all videos analysed number of successfully applied or dropped clips, and time for application of all clips. Costs were analysed in Euro. Statistical analysis was performed using student-t test.

Results: Mean number of clips used was 14 in Group 1 versus 10.9 in Group 2, $p<0.05$. Mean number of clips dropped was 0.8/5.3% versus 2.3/21.9%, $p<0.05$. Mean time for application was 16 minutes, 53 secs. versus 20 minutes 54 secs., $p>0.1$. Average time per effective clip application was 73.2 seconds versus 119.6 seconds, $p<0.05$. Cost analysis shows that an average of €686 was spent versus €490.50, $p<0.05$.

Conclusions: Effective clip application is more efficient and quicker when performed robotically. The gross cost of robotic clip application is higher robotically, due mainly to the greater number of clips used. This data has led to an immediate change in surgical practice, further increasing speed of application and reducing costs. Ongoing analysis of the data from this new scenario is being undertaken.