Laparoscopic Suturing and Knot-tying Practice Exercises Using a Do-It-Yourself Angle Trainer before Performing Laparoendoscopic Single Site Surgeries

Introduction and Objective: Laparoendoscopic Single Site (L.E.S.S.) suturing and knot-tying are performed with instruments at angles of 12.5-degrees and 17.5-degrees. It helps to practice laparoscopic suturing and knot-tying in a Do-It-Yourself Angle Trainer, so called because exercises are performed at angles of 45-degrees, 25-degrees and 15-degrees respectively between straight needle-driver and grasper. The objective is to present a Do-It-Yourself Angle Trainer for practice exercises in laparoscopic suturing and knot-tying prior to L.E.S.S. Surgeries.
Materials and Methods: Readily available materials were used in making the Do-It-Yourself Angle Trainer. Materials used were: straight 5 mm needle-driver and 5 mm grasper each inserted through 5 mm trocar, 10 mm zero-degree laparoscopic telescope inserted through 10 mm trocar, 20 cm long 3-O Polyglycolic acid suture with HR26 needle and 2.5 cm x 5 cm penrose drain with 2 cm long incision line for suturing. Laparoscopic telescope was in central position between the instruments. The angle between each instrument (telescope, needle-driver, grasper) and the horizontal line (simulating horizontal patient lie) was less than 55-degrees. Timed exercises were performed at angles of 45-degrees, 25-degrees and 15-degrees respectively between each needle driver and grasper.
Results: Practice on the Do-It-Yourself Angle Trainer was done in two series of timed-exercises. In the first series, penrose drain to be sutured was anchored in oblique 135-degrees position relative to telescope axis (simulating laparoscopic suturing in pyeloplasty, partial nephrectomy and ureteral surgery). In the second series, penrose drain to be sutured was anchored in perpendicular 90-degrees position relative to telescope axis (simulating laparoscopic suturing in prostatectomy, cystorrhapy and pelvic surgery). At 45-degrees angle between straight needle-driver and grasper, the time in seconds making the first suture with three knots was recorded followed by recording the time in seconds making the second to the fifth sutures. Similar timed-exercises were done at 25-degrees angle and 15-degrees angle respectively between straight needle-driver and grasper.
Conclusions: Presented is a Do-It-Yourself Angle Trainer using straight needle-driver and grasper for laparoscopic suturing and knot-tying practice exercises. Because of difficulties in laparoscopic suturing and knot-tying, it is highly recommended to practice these timed-exercises before performing Laparoendoscopic Single Site Surgeries.