Aim: Prospective evaluation comparing outcomes between laparoscopic (LIHR), robotic (RIHR), and open inguinal hernia repair (OIHR).

Material and Methods: Prospective institutional data comparison of patients undergoing inguinal hernia repair from 1999–2020 was performed. Patients with chronic pain or infection were excluded. Standard statistical methods were used and univariate analysis was performed between LIHR, RIHR, and OIHR groups.

Results: 3,300 repairs were performed: 1,970 LIHR (597-bilateral), 127 RIHR (25-bilateral), and 538 OIHR (43-bilateral). LIHR and RIHR patients were younger (55.4±14.8 vs 59.0±13.7 years; p<0.01), with lower BMI (26.6±6.5 vs 28.9±20.3 vs 31.6±7.6 kg/m²; p<0.01), fewer overall complications (2.7±1.9 vs 2.7±2.2 vs 3.7±2.5; p<0.01) and cardiac (0.2% vs 0% vs 2.6%; p<0.01) comorbidities, and fewer patients had diabetes (5.2% vs 6.6% vs 10.9%; p<0.01). OIHR had the highest rate of recurrent hernias (21.2% vs 11.2% vs 30.9%; p<0.01). History of smoking was less in LIHR (13.9% vs 30.9% vs 19.5%; p<0.01). Mesh was used in 99.5% of cases; synthetic was used in all minimally invasive cases and 98.4% of OIHR, with biologic mesh in 1.0% of OIHR due to bowel resection during the operation. Operative time was shortest in LIHR followed by open (86.5±39.6 vs 109.0±56.8 vs 92.6±55.2 min; p<0.01). Wound complications were more frequent in OIHR (0.8% vs 0.7% vs 3.8%; p<0.01). Admission was more common after open repair (2.2% vs 2.7% vs 5.7%; p<0.01) with a trend to less readmission following LIHR (1.0% vs 2.0% vs 2.3%; p=0.06). There were few recurrences overall (0.7% vs 0.7% vs 1.3%; p=0.40) with mean follow-up time 21.1±22.4 months.

Conclusions: LIHR, RIHR, and OIHR were performed with low overall morbidity and complications. Recurrent hernias and cardiac patients were most often repaired open, which more frequent admission and had higher wound morbidity. RIHR had longer OR times with no improvement overall outcomes.