SUMMARY AND CONCLUSIONS

(I) Robotic Myomectomy

Objective: To compare the surgical outcomes of robotic myomectomy (RM),laparoscopic myomectomy (LM) and open myomectomy (OM).

Study Design: Retrospective, case-matched analysis.

Patients and methods: All patients who underwent RM, LM, and OM at Cleveland Clinic were included. The 3 groups were compared regarding the baseline demographics, operative and immediate postoperative outcomes associated with each type of surgery.

Results: From a total of 575 myomectomies,3 93(68.3%) were OM, 93(16.2%) were LM, and 89(15.5%) were RM.. The three groups were comparable regarding size, number, and location of myomas after adjusting for age and BMI. Significantly heavier myomas were removed in the RM group compared to the LM group band was lower than the OM group. The RM group has significantly lower blood loss compared to the OM and the LM groups. Total surgical time in minutes was singnificantly longer in the RM group compared to the OM group but less than the LM group..Patients in the OM had significantly higher median length of hospital stay compared to the LM and RM.

Conclusions: Robotic myomectomy is associated with less blood loss, and length of hospital stay compared to traditional laparoscopic and to open myomectomy. Despite the robotic use is associated with longer OR time compared to open procedures. it still shorter than the laparo-scopic approach. It appears that robotic technology is able to convert more laparotomy cases to laparoscopic cases than traditional laparoscopy alone.

(II) Robotically Assisted Tubal reanastomosis

Objective: To compare between robotically assisted, standard laparoscopic and open tubal reanastomosis surgery in regards to surgical outcomes and cost analysis.

Study Design: Retrospective case matched analysis.

Patients and methods: All patients subjected to tubal reanastomosis Surgery between 1994 and 2008 at Cleveland Clinic were included and classified into 3 groups, namely Robotic, Laparoscopic and Open groups. The 3 groups were compared in regards to demographic data including age, BMI, gravidity, and parity. The surgical outcome measures including the total operative time, blood loss, and length of hospital stay were also compared. In addition, analysis of the total cost in US dollars between the three groups was performed.

Results: From 135 tubal reanastomosis cases, 34 were robotic, 17 were laparoscopic, and 84 were done by minilaparotomy. No significant difference has been reported between the three groups regarding age, BMI, gravidity or parity. Significant longer total operative time in minutes has been recorded in the robotic group,and the laparoscopic group compared to the open group. The amount of blood loss in mL was significantly less in the laparoscopic group,than in both robotic and open . Concerning the length of hospital stay all cases were discharged either in the same day or one day later without a significant difference among the three groups. The total cost in US dollars was significantly lower in the open group, when compared to both robotic and the laparoscopic .

Conclusion: Open (minilaparotomy) surgical approach in performing tubal reanastomosis is associated with shorter operative time, less total cost, higher blood loss and no effect on the length of hospital stay when compared to both robotically assisted and laparoscopic techniques.

(III) Robotically Assisted Ovarian Transplantation

Objective: To evaluate the feasibility of using the Da-Vinci robot in performing orthotropic transplantation of cryopreserved-thawed ovarian tissue and to compare outcomes to the Laparoscopy.

Study Design: Animal prospective comparative study.

Materials and methods: Seven female Merino sheep were randomly assigned to 2 groups; robotic (n=4) and laparoscopic groups (n=3). In both groups laparoscopic oophorectomy with subsequent slow freezing of the ovarian hemi-cortex was performed. One week later, the frozen tissue was thawed and orthotopically transplanted to a freshly created medullary surface of the remaining ovary using either the surgical robot (Da-Vinci) or standard laparoscopy according to the group. Two weeks later , the ovarian grafts were examined for viability, harvested, and fixed for histopathological examination .Viable follicles were counted in the fresh, cryopreserved-thawed, and transplanted tissue. The outcome measures were feasibility (measured by the percentage of procedures that are not converted to laparotomy), operating time, suturing time, graft viability and primordial follicular count.

Results: All animals in the robotic group were completed as such while one animal in the laparoscopy group was converted to laparotomy. The robotic group has a significantly shorter operating time compared to the laparoscopic group. Similarly, the actual suturing time in the Robotic group was significantly shorter than that in the laparoscopic group.The primordial follicle count was comparable in fresh, frozen- thawed and tranplanted ovarian tissue between the 2 groups

Conclusion: This experiment supported the use of the surgical robot in performing ovarian tissue transplantation which enabled the use of smaller suture and Total graft failure was seen equally in each group, suggesting that surgical technique alone will not overcome transplantation limitations.