

ROBOTIC SURGERY

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Elective Report

Robotics and Laparoscopic Surgery at St. Mary's Hospital, Paddington

I have always been interested in technology, inventing and innovation. I tend to look at every tool or procedure in life and think "I can think of a way to improve that". As well as my obvious interests in the human sciences, health and the treatment of disease, I would very much like to enter a surgical field that will enable me to improve and invent high-technology tools and new techniques. When thinking about my elective, I took a non-conventional route to my decision making and decided I would find my ideal placement within the UK based on my interests. This brought me to do some research. St. Mary's hospital in Paddington is world renowned for its high-tech approaches to laparoscopic and robotic surgery, so I contacted Professor George Hanna at the department of surgery and cancer.

After a brief induction, I quickly found my feet. I wanted to observe, assist with and learn about as many surgical procedures that fell under my interest base as possible. This involved moving around somewhat between teams (with permission from the operating surgeon of course) to gain maximum exposure to the range of procedures I planned to learn about. The first procedure I observed was a laparoscopic Nissen's fundoplication. This procedure was performed on a gentleman who was experiencing gastro-oesophageal reflux while lying flat and was discovered to have a sliding hiatus hernia. Using a range of laparoscopic tools the oesophageal hiatus (the opening in the diaphragm through which the oesophagus passes) was narrowed, before wrapping the fundus of the stomach around the oesophagus and suturing in place. I found this procedure remarkably simple yet effective. Other procedures I saw throughout my time on elective included hernia repairs, gastric banding for obese patients who needed weight reduction through producing an iatrogenic early satiety, and gastrectomies where the stomach and lymph node stations were removed in cases of gastric cancer.

I was impressed by some of the innovative equipment used in many of the procedures I observed. In gastric banding, the band is sutured on, laparoscopically, to the upper portion of the stomach. A port is then sutured into the skin, which can later be used to adjust the thickness of the band by injecting or aspirating saline solution. Again, in a gastrectomy, some of the stapling equipment was incredibly advanced, being able to bisect, and simultaneously staple a section of small bowel. I was especially impressed with the anastomotic autosuture gun which was used to join a section of small bowel to the oesophagus after the stomach had been removed.

On the thursday of my first week I found out that a robotic surgical procedure was taking place in the Patterson Center, the surgical innovation centre at St. Mary's. When I arrived, I introduced myself and was welcomed in by Professor Vale. The first patient was brought in for a radical robotic prostatectomy. I watched as the robot was set up and simultaneously as the patient was being prepared for the operation. The professor and assisting surgeon scrubbed up and after the patient was cleaned and draped, a number of laparoscopic ports were inserted into his abdomen. Next, the camera and a number of laparoscopic tools were connected to the robot's arms. Finally, the professor sat at the console in the corner of the room and began to operate by moving two pincer-like joysticks. This was a mind blowing experience as I was not aware a robot could have such beautiful wrist articulation which mimicked the surgeon's hand movements with a fluidity that could only be described as eerily lifelike. The procedure allowed the surgeon to use a precision that would be unknown to a human hand. The machine works by

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translating the surgeon's large movements into small movements of very small robotic pincers, scissors, needle holders and diathermy tools. It also eliminates any tremor the surgeon may have. The assisting surgeon worked at the patient's side with regular laparoscopic equipment. When I got home I couldn't contain my amazement about the procedure I had seen, and left with a new-found ambition to follow in this professor's footsteps. Over the following weeks I watched more of the same procedure and this consolidated the methods of the procedure, as well as the anatomy of the region.

As robotic surgery is a relatively new and constantly improving discipline, surgeons are constantly learning new things and using new devices. I noticed that one of the surgeons was using a certain machine, the Da Vinci Si, for his first time on a real patient. The robots used are designed to be intuitive as possible but as well as being exciting, it must be a slightly daunting task when a surgeon, highly skilled as he may be, operates for a first time with a new piece of equipment - especially when the equipment is performing the operation on your behalf! This emphasizes the extremely important need for surgeons to keep their skills razor sharp, even in an environment where cutting-edge technology is being used.

Although an exciting placement, this was not entirely what I had envisioned. I pictured myself in a lab surrounded by robotic prototypes and a team of biomedical engineers and surgeons collaborating on technology improvements. My placement ended up being very clinical. I have had a lot of surgical exposure, observing gastrointestinal and urological surgery being performed and surgeons who have been willing to teach have given me a good overall experience of a vast range of procedures. I am glad that I branched out and explored the surgery of other specialities from my elective attachment as this gave me the opportunity to see innovative robotic surgery. The times I didn't enjoy too much, however, were times when I was in theatre without a very good view of what was going on. Scrubbed staff were surrounding the patient and I felt a little lost, not being able to follow a procedure due to not being able to see. Luckily, however, this was a rare occurrence and I even got to scrub up and see the operation up close. These were the more interesting times.

If I could do anything differently, it would have been to make contact with a number of robotic and laparoscopic surgeons before the placement. This would have allowed me to be more clued in about all the procedures, particularly robotic and high-tech, going on across various teams for each day, enabling me to see an even wider range of different high tech procedures. Overall, staff were friendly, approachable and helpful, and willing to teach. I have enjoyed and learned a lot on my elective and would recommend it to others who have an interest in laparoscopic, robotic or other high tech surgery.