Minimally invasive interventions performed with the Italian surgical robot 'ALF-X'

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It's called ALF-X and it's the innovative robotic surgical system being used by gynaecological surgeons at the A. Gemelli University Polyclinic in Rome, which has been in operation in the surgical field for a year in the Department for the Protection of Health of Women, Newborns, Children and Adolescents, directed by professor Giovanni Scambia. The new robotic surgical system was used for the first time ever at Policlinico Gemelli for laparoscopic gynaecological surgeries. Before being used elsewhere, more than 150 interventions have been successfully performed with ALF-X during this year. "In a dedicated operating room" said prof. Scambia, "we performed two operations per day, five days a week at Gemelli using the innovative, latest generation tele-robotic surgical system, conducting a large trial which gave completely positive results."

ALF-X, controlled with maximum precision by the surgeon through a console, is used for all gynaecological interventions that have a laparoscopic indication: benign diseases and the initial stages of gynaecologic cancers. The robot will improve the quality and effectiveness of surgery through precise coordination of the surgeon's hand with the instrument. An advanced eye tracking system is used to control the endoscopic vision in three dimensions through sensors which move the 3D high definition camera around the surgical field by following the surgeon's eye movements. This eye tracking system also lets the surgeon easily zoom in the 3D image for a full view, even down to the smallest detail.

The 3D monitor in the console gives the surgeon a constant three-dimensional view of the surgical field, improving depth perception of the tissue layers and the organs on which the surgical procedure is being performed. ALF-X, the result of Italian research (SOFAR SPA) and collaboration with the European Union (JRC Research Centre), is the first system in the world that allows the surgeon to remotely sense the forces generated on the organs and tissues, giving the surgeon an important sense of touch: this is particularly useful during dissections, the reconstruction stages and the application of sutures, where the perception of the applied force is of fundamental importance in the complex movement control mechanism. To date Telelap ALF-X has already been certified for use in gynaecology, urology, thoracic surgery and general surgery.

"The new system has also proven to be very easy to use for all personnel - said prof. Scambia - and its precision allows manoeuvres to be made that fully respect the abdominal integrity of the patients".

So far, Professor Scambia's surgical team has performed about 150 interventions pertaining to hysterectomies and the removal of both ovaries; the patients had an excellent post-operative period void of any complications and a rapid return to their daily activities; no adverse events, intra-operative or remote complications were recorded.

ALF-X is a system that is also characterized as having an excellent cost/benefit ratio due to the re-usability of all the instruments. This is something that could make it a good choice for Institutions and useful for patients, aiming at effective cost management while keeping the highest level of safety and efficacy for both patient and surgeon.

"Telelap ALF-X - Giovanni Scambia concludes - is therefore an innovative platform for the development of laparoscopic surgery and opens the door to a new era of minimally invasive surgery. The system is

expected to become a valuable aid to the surgeon, offering a higher level of quality and safety during surgical procedures, with expected large-scale use and combining the quality and effectiveness of surgery with low operating costs."

Provided by Catholic University of Rome

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