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Editorial

Role of robotic platforms in bariatric revision surgery

Papel de la plataforma robótica en la cirugía bariátrica revisional

Once bariatric surgery was established as the main therapeutic option for severe obesity and associated diseases, the logical increase in procedures has been accompanied by an increase in scheduled reoperations as a result of unsatisfactory results, sequential strategies, or long-term complications.[1] Likewise, although revision surgery is associated with a much higher number of undesirable postoperative events compared to primary surgery,[2] the ability to use minimally invasive approaches has contributed towards making these procedures reasonably safe. In addition, revision procedures also provide the opportunity to correct and even reverse surgeries performed in the early stages of bariatric surgery, which had been considered unmanageable until now. This trend has been reflected in the number of patients requiring revision procedures, representing more than 11% of cases in the latest IFSO registry. In Spain, the figure is closer to 8.5% according to data provided by SECO in the 2021 activity survey.[3]

Revision surgery is clinically challenging because it combines the highest technical complexity with a very demanding pre-, intra- and post-operative decision-making process. These patients often present an anatomy that has been distorted by previous procedures (sometimes multiple and not always described correctly) and the presence of adhesions. In addition, these are patients in whom neither the disease itself nor the associated pathologies have been monitored, with a nutritional state that is sometimes suboptimal and reasonable doubts about expectations or adherence to treatment and subsequent follow-up visits. In this highly demanding context, it seems logical to provide the patient with the approach that delivers the best results, offers the surgeon the most precise tools, and gives the healthcare system a favorable benefit-cost ratio. In this context, the use of robotic platforms for bariatric surgery is a valid option for these 3 criteria.

According to figures provided by IFSO, more than 3800 robotic revision procedures are currently performed (12% of the total) while in Spain the rate is around 7.4%, with a clear upwards trend.[4,5] In less than 2 years, the number of medical centers that used robotic platforms for bariatric surgery went from 8 to 20 and reported more than 1600 interventions, 8.2% of which were revision procedures. To this day, the most performed procedure by far is the conversion from sleeve gastrectomy to gastric bypass. Curiously, this is followed by single anastomosis duodenal-ileal (SADI) bypass after sleeve gastrectomy.[6]

The robotic approach in revision surgery basically has 2 advantages: the minimization of the BMI effect, and the lower level of difficulty inherent to the procedure. On the one hand, robotic surgery using platforms that allow access to all quadrants of the abdomen provides greater maneuverability and better ergonomics, making it possible to reduce the influence of certain factors (the resistance of a thick abdominal wall, the presence of visceral adiposity, or extreme hepatomegaly typical of patients with very high BMI, etc). In this manner, and as our group has verified, it is possible to carry out procedures in a single stage instead of a sequential strategy, always in a setting with the utmost safety and resulting in a favorable benefit-cost ratio. Thus, not only is a second intervention avoided, but a complete care process is also avoided, while the appearance of complications is minimized. This significantly reduces the consumption of resources that far exceeds the direct costs derived from the use of the robotic platform. Furthermore, maneuvers that are sometimes very difficult using a laparoscopic approach are greatly simplified, including

adhesiolysis, individualization of anatomical structures, measurement of intestinal limbs in hypoabsorptive procedures, or performance of combined procedures (cholecystectomies, hiatal hernia repairs, etc). In our experience, robotic revision surgery has clearly been associated with fewer complications, less pain perceived by the patient, and shorter mean hospital stay.

Although in the initial phases the robotic approach included assistance ports, currently the so-called "*real robotic*" format provides the best capabilities. The incorporation of various technical improvements (advanced bipolar sealers, second-generation robotic endostaplers, etc) make this type of approach nearly "essential" to perform these procedures reliably. Likewise, if we were to list fundamental characteristics that a robotic platform or system must have, they would include: (1) being "immersive", meaning that they provide maximum precision through the possibility of working at very close distances; (2) provide maximum autonomy to the surgeon, minimizing possible interferences or complications derived from the maneuvers carried out by an assistant through an assistant port; (3) provide multi-quadrant vision and maneuverability; and (4) have high-precision controllers, which will probably incorporate haptic feedback in the future.

The real problem with robotic revision surgery is the skepticism with which some sectors of the scientific community and the administration view an apparently expensive therapeutic option in the first place, for which there is still no conclusive evidence.[7] Curiously, the second question will be easier to resolve considering that the profitability of the robotic approach is long-term, so the reduction in complication rates and the number of associated processes will have a clear impact on direct and indirect costs. However, as in the early phases of the initial implementation of laparoscopy, resistance to change and the disparity in access to technology decisively influence the opinion of the surgical community about the use of this type of resource in a situation as complex as revision surgery.

In our setting, the only platform used is Da Vinci® (Intuitive Surgical, USA), and there is great disparity in terms of the availability of models as well as the type of approach (assisted versus completely robotic). This is strongly influenced by both the limitations of acquiring and managing a resource that is a significant investment and must be shared with other specialties as well as the dizzying evolution of applied technology. Thus, there are clear differences in terms of the actual context in which the robotic approach is applied, creating a "technological bias" that probably affects the results, as not all hospitals have the same capability to incorporate the technical innovations that are constantly appearing. Consequently, the results are heterogeneous and generate a substantial gap between what is observed in clinical practice and what is objectively recordable and, therefore, evaluable and publishable. As a result, the quality of the different systematic reviews published to date is very low, and they provide results that are difficult to interpret, often influenced both by the type of platform used and by the procedure or indication.[8–11] In other words, this double bias derived from the "technological gap" and the lack of uniform indications probably makes it difficult to obtain real evidence about the benefits of robotic revision surgery, since data from groups with less access to the most advanced technology will always coexist with data from professionals who have access and more accumulated experience.

Finally, although it is always risky to categorically determine the requirements necessary to perform a procedure, the growing experience with the robotic platform seems to indicate that it could provide the ideal setting to perform bariatric revision surgery. If the most complex patients require the best resources, robotic bariatric revision surgery provides the opportunity to obtain the best results while maximizing safety in a context that is most likely beneficial in terms of costs.

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