



# Are we really seeking for equivalence? – The virtue of the robot is in technology

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Radical cystectomy (RC) with pelvic lymph node dissection (PLND) and urinary diversion (UD) is the gold standard treatment for organ-confined muscle-invasive bladder cancer (MIBC) and recurrent non-muscle invasive disease (1). The open approach is still considered the reference option though the robot-assisted one has recently begun prevailing in western countries (2,3), mainly because of the expected advantages of this minimally-invasive technology in terms of reduced morbidity. Nevertheless, the superiority of robotic surgery remains debated: while most of the authors agree with the finding that this approach reduces intraoperative blood loss and transfusions (4), all the available randomized controlled trials (RCTs) failed to prove any significant difference in minor and major complications rate, both at 30 and 90 days after surgery (5-9).

Cystectomy is indeed a complex procedure and most of its morbidity is ascribed to the reconstructive surgical step (10). Because of this, despite Pasadena Consensus Conference recommendations (11) and potentially undermining the expected benefits of laparoscopy, a non-negligible share of surgeons still prefer an extracorporeal approach to the UD (12), despite this strategy does not improve complications rate (13).

The most important aspect in cancer surgery is oncological outcomes durability and, up to today, there has been paucity of studies comparing robot-assisted radical cystectomy (RARC) to open radical cystectomy (ORC).

Although Wei *et al.* recently suggested that recurrence

patterns may be due to pre-existing micrometastases rather than pneumoperitoneum and tumor spillage (14), in the past years there have been concerns regarding higher rates of local recurrence in the minimally-invasive setting. Both Nguyen *et al.* (15) and Bochner *et al.* (6), in fact, observed an increased incidence of peritoneal carcinomatosis and extrapelvic lymph nodes involvement (though the difference was not statistically significant).

We recently proved that RARC does not increase the rate of positive surgical margins (4) and the lymph node yield [which significantly affects survival (16,17)] is not jeopardized by the minimally-invasive approach (33.4 *vs.* 30.7; *P*=0.41) (4). At 2 years follow-up, robotic and open cohorts displayed comparable recurrence-free survival (RFS) (87.8 *vs.* 84.4; log rank *P*=0.746), cancer-specific survival (CSS) (89.6 *vs.* 88.3; log rank *P*=0.753) and overall survival (OS) rates (85.2 *vs.* 86; log rank *P*=0.909) (4). Also 5 years after surgery, oncologic outcomes of RARC appeared in line with historical open experiences (RFS, CSS and OS probabilities were 58%±5%, 61%±5% and 54%±5%, respectively) (18). Also RCTs recently confirmed that cancer control is not affected by the surgical approach, in the midterm (5-9). Still, there is a dearth of evidences supporting this equivalence in the long period. In 2014, Snow-Lisy *et al.* reported 10-year outcomes after minimally-invasive (laparoscopic and robotic) RC: RFS, CSS and OS were 54%, 63% and 35%, respectively (19). Just recently, Hussein *et al.* provided a relevant contribution to the

current literature publishing long-term results from the International Robotic Cystectomy Consortium: ten years after surgery, RFS was 59% while CSS and OS were 65% and 35% (20). Although the very first cases were also included in the analysis, such outcomes are consistent with those from large open series (21).

Then, most of the available studies support the equivalence of RARC and ORC in terms of morbidity and oncologic outcomes; the minimally invasive approach seems to overcome the conventional one only in terms of a reduced risk of transfusions and this might not be enough to justify its substantially increased costs (22).

Few authors, however, are investigating the role of near-infrared fluorescence technology in enhancing anatomical structures identification thus potentially improving both safety and efficacy of RARC. In 2014 Manny and Hemal first reported on the feasibility of identification of sentinel node drainage (23). In the same year, Chopra *et al.* suggested to use the Firefly® module in assessing bowel vascularity to avoid mesenteric arcades injuries when isolating a segment of intestine for intracorporeal ileal neobladder construction (23). More recently, Ahmadi *et al.* resorted to intraoperative indocyanine green to assess the vascular integrity of the distal ureter before the uretero-enteric anastomosis was performed and observed that the use of this technology significantly reduced stricture rate (0% *vs.* 10.6%;  $P=0.020$ ) (23).

Concluding, based on the available evidences we can only state that ORC and RARC are broadly equivalent concerning safety and mid-term efficacy; future long term RCTs are needed to compare oncologic outcomes durability.

We are deeply persuaded that, to unveil the advantages of the robotic surgical system in the field of cystectomy, the concept of “replicating the open principles” should be abandoned and a comprehensive resort to its technology is mandatory (24).

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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