

## Robotic Assisted Radical Cystectomy, Current Status and Future Directions

Sarfraz Ahmad\*

Department of Urology, Aberdeen Royal Infirmary Hospital, Aberdeen, UK

Advancement in technological front paves the pathway for development of new surgical techniques. These new techniques continuously challenge the established “gold standards”. Robotic assisted minimal invasive surgery is one of these advancements of present era. New medical gadgets are fascinating but a careful evidence based approach is needed before adopting these innovations in clinical practice.

Open radical cystectomy (ORC) is still considered as a standard procedure for muscle invasive bladder cancer however, Robotic assisted radical cystectomy (RARC) is gaining popularity [1,2]. Before general acceptability, like any other new procedure, RARC is required to answer important issues. First, is this a safe procedure? Second, can it provide same or better oncological and functional outcomes as compared to ORC? Third, can it reduce intraoperative/postoperative complications and can it improve survival?

All of these questions have been assessed and reported in literature, but the strength of evidence is somewhat immature in few areas. Recent publications [3-5] and consensus from Pasadena conference of world experts in Radical cystectomy have covered many areas regarding this rapidly evolving urological procedure. Overall, these publications provided a supportive comprehensive review of the literature covering various aspects of RARC. Although, definitive comparisons of oncological and functional outcomes between ORC and RARC are lacking, early results appear comparable [4]. Bochner et al. [2] reported similar rates of perioperative complications and lengths of hospital stay among ORC and RARC. However, blood loss was significantly lower in RARC group but high-grade complications were not statistically different. Importantly, pathologic variables e.g. positive surgical margins and lymph node yields were similar in both ORC and RARC [6]. Likewise, three and six month's quality of life (QOL) outcomes were equal. However, RARC was found to be more expensive than ORC on cost analysis [6]. Safety issues relating to RARC have been reported in a meta-analysis [7] comparing RARC and ORC. In contrast to Bochner et al. data, this analysis showed a statistically significant lower incidence of high grade complications in RARC cohort. While operating time was significantly higher in the RARC group. However, difference in mortality, positive margin rate, overall and lower grade complications between the two cohorts didn't achieve statistical significance [7]. Long-term survival outcomes for RARC are also noted to be similar to ORC [8]. Khan et al. [9] showed an overall survival of 64%, disease-specific survival of 75%, and disease-free survival of 50% after RARC at minimum of 5 years follow up. Furthermore, RARC is not known to act as an independent predictor of recurrence [10].

There has been much debate on the suitable approach for urinary diversion (intracorporeal or extracorporeal) following RARC. Intracorporeal urinary diversion (ICUD) has the potential advantages of a small incision, decreased bowel exposure and less post-operative pain. Ahmed et al. [11] reported perioperative outcomes of patients undergoing extracorporeal urinary diversion (ECUD) and ICUD following RARC. In this retrospective analysis, gastrointestinal complications were significantly lower in the ICUD group. However, interestingly, the operative time was equivalent for both types of urinary diversions. Although patients in the ICUD group have marginally longer hospital stay but no difference in the reoperation

rates at 30 days and complications rate at 90 days was observed. RARC has comparable health-related quality of life (HRQL) outcomes to ORC [12]. Comparisons of diversion techniques (ECUD vs. ICUD) showed similar findings in baseline and postoperative HRQL with no significant differences in body image domains [12]. Oncological, functional and complications following RARC with total intracorporeal neobladder were also reported similar to that of open procedure [13].

Regardless of approach, radical cystectomy remains an operation with high morbidity. Current evidence support that RARC is as good as the ORC procedure in terms of oncologic and perioperative complications. However, RARC is superior in terms of less blood loss and hence reduced need for transfusion [6,7]. RARC also provides excellent nodal counts, negative surgical margin rates, and 5 -10 years oncologic outcomes [8].

Before wider acceptance of RARC, more robust, unbiased transparent reporting and addressing three important issues is required. First, high volume multicentre based prospective RCT comparing ORC and RARC with focus on total ICUD. Second, urology community needs to define pathways to reduce operative time and cost associated with RARC. Third, functional outcomes (continence, potency, quality of life) should be important part of future trials. This will not be an easy journey but, among Urologists there is a lot of enthusiasm to explore all of these areas and in fact most of work is already under progress. So far, literature is supportive of RARC and future looks bright for this procedure. However, further conclusive evidence will be welcome to consolidate RARC in routine practice.

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\*Corresponding author: Sarfraz Ahmad, Department of Urology, Aberdeen Royal Infirmary Hospital, Aberdeen, UK, Tel.:44 7546712151; E-mail: [drsarfrazrana@hotmail.com](mailto:drsarfrazrana@hotmail.com)

Received March 31, 2015; Accepted April 01, 2015; Published April 05, 2015

Citation: Ahmad S (2015) Robotic Assisted Radical Cystectomy, Current Status and Future Directions. *Med Surg Urol* 4: e111. doi:10.4172/2168-9857.1000e111

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**Citation:** Ahmad S (2015) Robotic Assisted Radical Cystectomy, Current Status and Future Directions. Med Surg Urol 4: e111. doi:[10.4172/2168-9857.1000e111](https://doi.org/10.4172/2168-9857.1000e111)

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