Robotic partial nephrectomy under opioid free general anesthesia (OFA): a comparative study

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Background and objectives

Robotic partial nephrectomy (RPN) has traditionally been performed under regular general anesthesia (RGA) with **opioid analgesics**. However, opioids are associated with adverse drug events (including **nausea, vomiting**, constipation, postoperative sedation), which lead to an **increased length of stay**. The aim of our study was to compare recovery outcomes between OFA and RGA.

Materials and methods

We retrospectively analyzed the files of **93 patients** who underwent a RPN for cancer, between January 2016 and November 2017. We stratified the cohort into groups according to the type of anesthesia. **26 patients** received OFA protocol (Dexmedetomidine, Lidocaine, Ketamine and Dexamethasone). **67 patients** underwent surgery with RGA (Sufentanil or Remifentanil, dexamethasone, ketamine and lidocaine according to anesthesiologist choice). Post-operative analgesia was multimodal (NSAID, nefopam, acetaminophen, lidocaine, tramadol). Morphine was used as rescue analgesia, by oral route in floor or intravenous (IV) route in PACU.

We compared **occurrence of PONV** and use of anti emetics, **maximal numeric pain scale (MNPS)** and **opioid consumption** in the first 48 hours, and **length of stay** in the two groups. Statistical analyses were performed with JMB Statistical Discovery Software

Results

There were slightly more men in both groups (OFA group 54% and 61% in RGA group, respectively), mean age of 56 (± 14) years in OFA group and 58 (± 13) years in RGA group.

OFA was significantly associated with **less PONV** : 12% vs. 37%, $p = 0.02$ (Fig. 1). We also observed a significant **reduction of length of stay** : 3.1 ± 2.6 days vs. 4.4 ± 2.6 days, $p < 0.0001$ (Fig. 2).

Figure 1: comparison of PONV between RGA and OFA groups

Figure 2: comparison of LOS between OFA and RGA groups

A trend of **reduction of postoperative morphine consumption** (expressed in equivalent IV morphine) was found in OFA group : 1.5 ± 2.7 mg vs. 4.5 ± 7.7 mg ($p=0.09$) at day 1 and 0.4 ± 1.1 mg vs. 1.5 ± 3.2 mg ($p=0.11$) at day 2, without reaching the significance (Fig.3).

Figure 3: opioid consumption at day 1 and 2 in OFA and RGA groups

We observed in OFA group a **MNPS score reduction** : 4.3 ± 2 mm vs. 4.5 ± 2.2 mm, $p=0.69$ at day 1 and 2.4 ± 2.2 mm vs. 3.3 ± 2.2 mm, $p=0.05$ at day 2 (Fig. 4). These results didn't reach the significance.

Figure 4: MNPS at day 1 and 2 in OFA and RGA groups

Conclusion

This retrospective study confirms our hypothesis. Despite the lack of significance, the trend of decrease of opioid requirements observed in the OFA group allows to observe a **significant reduction of PONV and length of stay**. These results must be confirmed by a prospective evaluation.

Since abstract submission we continued to include patients to improve our work's power. With an increase of effectiveness from 93 to 108 patients, we observed similar results (Fig5).

	Regular anesthesia (n=73)	OFA (n=35)	P-value
PONV/use of antiemetics (%)	33%	11.4%	0.02
Opioid consumption D1 (mg)	4.1	1.5	0.25
Opioid consumption D2 (mg)	1.3	0.3	0.15
MNPS D1 (mm)	4.1	4.0	0.87
MNPS D2 (mm)	3.2	2.5	0.05
LOS (days)	3.7	3.1	<0.0001

Figure 5: Mean results in February 2018