CLINICAL ARTICLE summary

Study Title:	Robotic partial nephrectomy performed with AirSeal versus a standard CO_2 pressure pneumoperitoneum insufflator: A prospective comparative study
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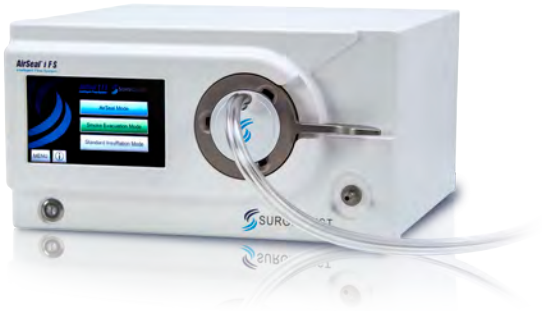

ABSTRACT

Background:
AirSeal represents a new generation of valveless and barrier-free surgical trocars that enable a stable pneumoperitoneum with continuous smoke evacuation and carbon dioxide (CO_2) recirculation during surgery. The aim of the current study was to evaluate the potential advantages of the AirSeal compared to a standard CO_2 insufflator in the field of robotic partial nephrectomy (RPN).

Methods:
Between October 2012 and April 2015, two cohorts of 122 consecutive patients with clinically localized renal cell carcinoma underwent RPN by a single surgeon, with the use of a standard CO_2 pressure insufflator (Group A, 55 patients) or AirSeal (Group B, 67 patients) and were prospectively compared.

Results:
The two groups were similar in baseline, preoperative characteristics. The mean dimension of the lesion, as evaluated by contrast-enhanced CT scan, was 30 (median 28; IQR 2) and 39mm (median 40; IQR 2) for Groups A and B, respectively ($p < 0.05$). The complexity of the treated tumors was similar, as indicated by the mean RENAL nephrometry score. Positive surgical margins rate was similar in both groups (3.6 v 4.5 %, $p = 0.8$) as well as the need for postoperative blood transfusion (9.1 vs 4.5 %,$p = 0.3$) and the development of postoperative acute kidney injury (16.4 vs 10.4 %, $p = 0.3$). Mean operative time and warm ischemia time were significantly shorter in Group B. Moreover, a significant increase in the cases performed as "zero ischemia" was observed in Group B (7.3 vs 30 %, $p < 0.01$).

Conclusions:
This is the first study comparing the AirSeal with a standard CO_2 insufflator system in the field of the RPN. The preliminary outcomes in terms of overall operative time, warm ischemia time and cases performed as "zero ischemia" are better with respect to the standard insufflator. The feasibility, safety and efficacy of combining laser tumor enucleation with the valve-free insufflation systems should be evaluated.

KEY TAKEAWAYS

- **AirSeal Reduced Procedure Time by 11%***
- **AirSeal Reduced Warm Ischemia Time by 39%***
- **AirSeal Enabled a Clampless (Zero Ischemia Approach) in 30% of Procedures***

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*As extrapolated from published data.

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