

**Background:** It is uncertain which factors substantially influence outcomes after uvulopalatopharyngoplasty (UPPP) in patients with supine predominant obstructive sleep apnea (POSA)

**Objective:** This study aims to explore the predictors of UPPP outcomes in patients with supine predominant obstructive sleep apnea (POSA).

**Methods:** A total of 108 obstructive sleep apnea patients, 52 positional patients and 56 non-positional patients (NPP), who underwent overnight polysomnography were included. The upper airway (UA) anatomy was evaluated by three-dimensional computer tomography (3D-CT). All patients underwent revised UPPP with uvula preservation and were followed using polysomnography for at least 3 months postoperatively. The responders to the surgical treatment were defined as having a  $\geq 50\%$  reduction in base line AHI and a final AHI of  $< 20$  events/h.

**Result :** No difference was found in surgical success rates between NPP and POSA undergoing UPPP. In POSA patients, there were significant differences between responders and non-responders in body mass index (BMI), preoperative supine AHI, and time of  $\text{SaO}_2 < 90\%$  (TS90)

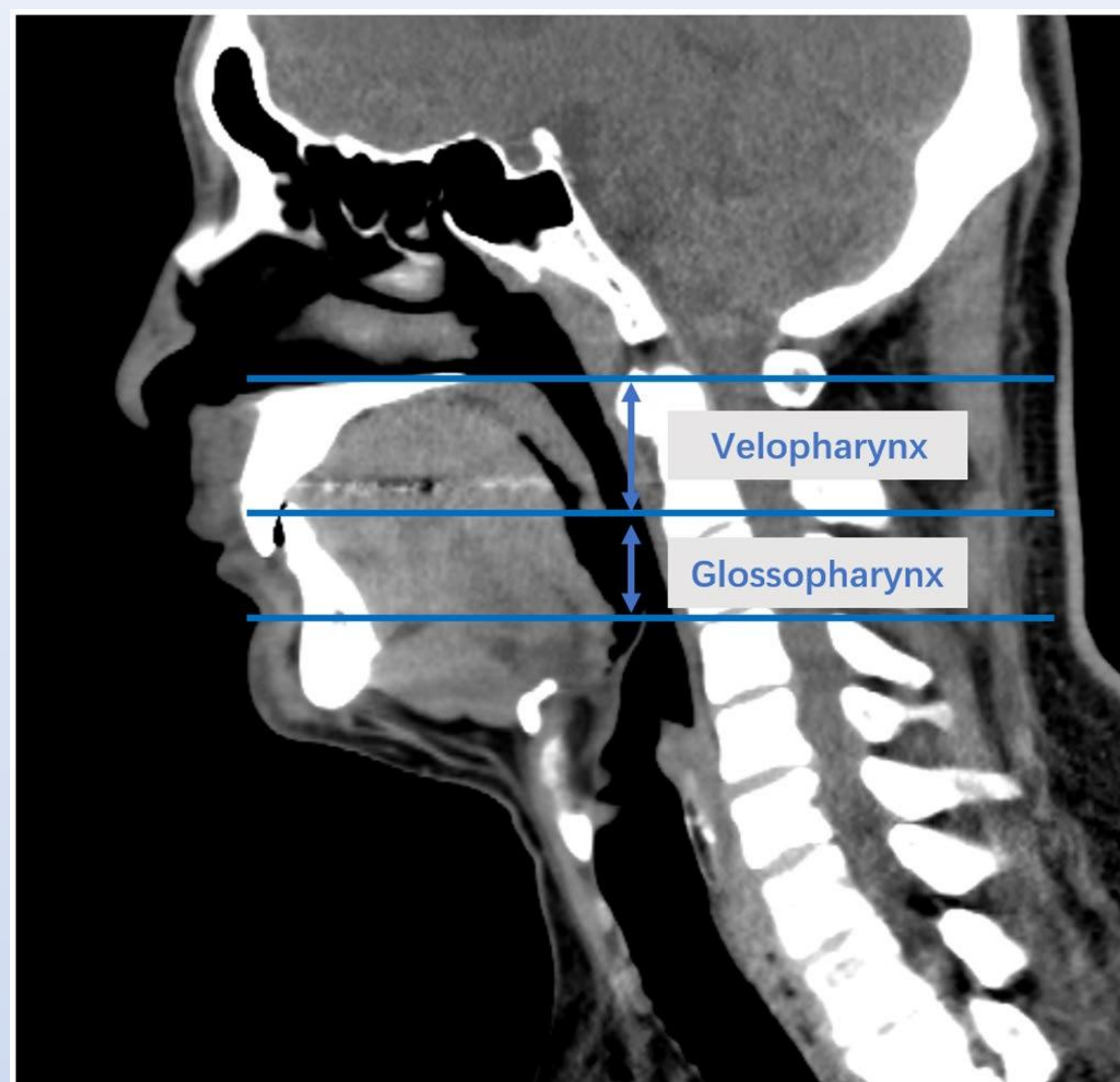


Figure 1. Segments of the upper airway in mid-sagittal plane: velopharynx and glossopharynx.

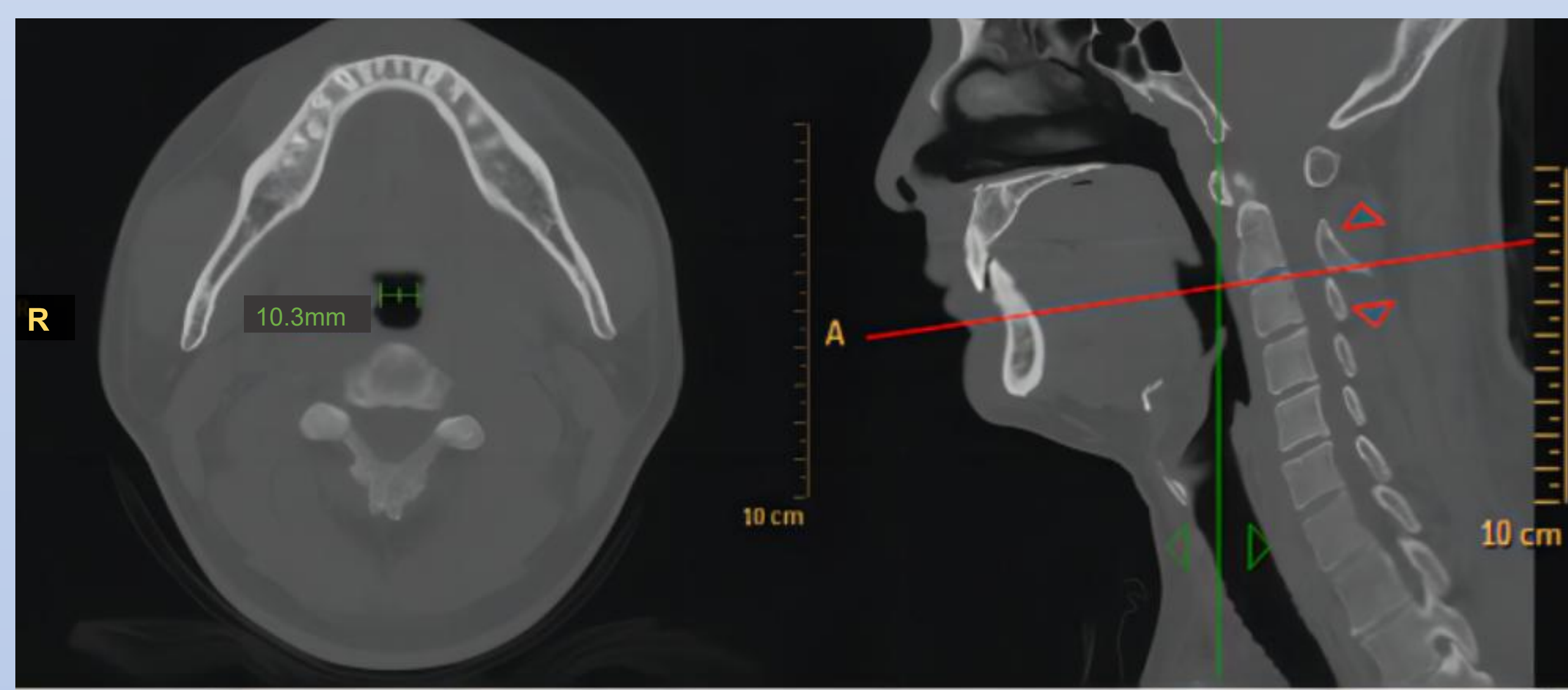


Figure 2. The minimal lateral airway dimension at velopharynx.

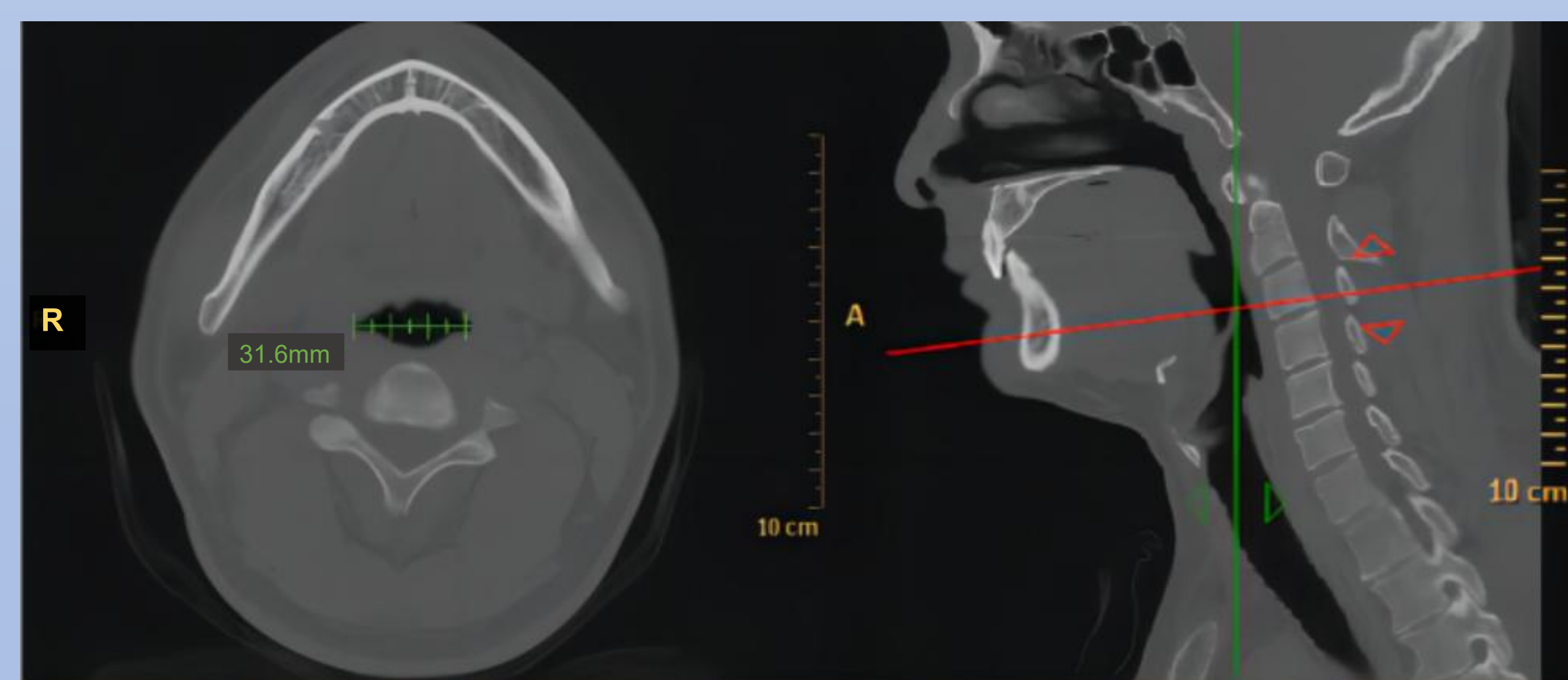


Figure 3. The minimal later airway dimension at glossopharynx.

(all  $P < 0.05$ ). The responders had narrower minimal anteroposterior airway (mAP) ( $P = 0.016$ ), minimal lateral airway (mLAT) ( $P = 0.002$ ), minimal cross-sectional airway area (mCSA) ( $P < 0.001$ ) at the velopharynx and wider mLAT ( $P = 0.014$ ) and mCSA ( $P = 0.002$ ) at the glossopharynx. The independent associated actors for surgical success were lower BMI ( $p < .001$ ), narrower mLAT ( $p = .002$ ) and mAP ( $p < .001$ ) at velopharynx, and wider mCSA ( $p < .001$ ) at glossopharynx in POSA.

Table Logistic regression analysis

	Odd Ratio	95% confidence interval	P
Body mass index, $\text{kg}/\text{m}^2$	1.077	1.043-1.111	$< 0.001$
VmAP, mm	1.213	1.144-1.286	$< 0.001$
VmLAT, mm	1.089	1.032-1.049	0.002
GmCSA, $\text{mm}^2$	1.004	1.002-1.006	$< 0.001$

VmAP: minimal anteroposterior airway dimension at velopharynx; VmLAT: minimal later airway dimension at velopharynx. GmCSA: minimal cross-sectional airway area at Glossopharynx.

**Conclusion:** POSA patients with lower BMI, narrower mLAT and mAP at velopharynx, wider mCSA at glossopharynx were more likely to achieve a positive outcome with H-UPPP.

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