ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Comparison of the LMA Protector and the Baska Mask in Retrograde Ureteroscopic Surgery: A Prospective Randomized Clinical Study

LMA Protector ve Baska Maskın Retrograd Üreteroskopik Cerrahide Karşılaştırılması: Prospektif Randomize Klinik Çalışma

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ABSTRACT Objective: The Baska and the Protector Laryngeal masks are single-use second-generation supraglottic airway devices with a dual gastric channel. **Material and Methods:** 64 American Society of Anesthesiologists physical status 1-2 patients between the ages of 18-70 undergoing retrograde ureteroscopic surgery enrolled in this prospective randomized study. **Results:** Demographic airway variables and airway characteristics were similar between the groups. Insertion time was shorter in the Baska mask group [14 (11-20) versus 20 (13-27) seconds, p=0.035]. The need for optimization maneuvers during insertion was higher for the Baska mask group (p=0.009). The laryngeal mask airway (LMA) insertion was easier in the LMA Protector group (p=0.023). The first insertion success rate was 75% for the LMA Protector and 84% in the Baska mask. The total success rate of both devices was 91%. Nasogastric tube insertion was faster in the Baska mask group [14 (12-15) versus 17 (13-25) seconds; p=0.003]. Fiberoptic views were similar between the groups. Minute volume after insertion of the device was higher in the LMA Protector group [8 (6.5-10) L/min versus 6 (5-7) L/min; p<0.001]. Expiratory tidal volume was higher in the LMA Protector group after insertion of the device, 15 minutes, 30 minutes, and 45 minutes after insertion (p<0.001, p=0.032, p=0.001, p=0.027 respectively). The end-tidal sevoflurane concentration (ETsevo) 30 minutes after device insertion was higher in the Baska mask group (1.49±0.38 vs 1.75±0.36; p=0.014). **Conclusion:** The LMA Protector is superior to the Baska mask in providing higher tidal volumes and decreased need for optimization maneuvers in retrograde ureteroscopic surgery.

Keywords: Adult; laryngeal masks; mechanical ventilation; ureteroscopy

ÖZET Amaç: Baska ve Proseal Laringeal maskeleri, 2'li gastrit kanala sahip olan tek kullanımlık 2. jenerasyon supraglottik havayolu araçlarıdır. **Gereç ve Yöntemler:** Retrograd üreteroskopik cerrahiye alınacak, Amerikan Anestezistler Derneği 1-2, 18-70 yaş arası 64 hasta prospektif randomize çalışmaya dâhil edildi. **Bulgular:** Demografik verileri ve havayolu karakteristikleri gruplar arasında benzerdi. Baska mask grubunun yerleştirme zamanı kısaydı [14'e (11-20) kıyasla 20 (13-27) saniye, p=0,035]. Yerleştirme sırasında ihtiyaç duyulan optimizasyon manevraları Baska mask grubunda fazlaydı (p=0,009). Laringeal maske havayolu [laryngeal mask airway (LMA)] yerleştirmesi, LMA Protector grubunda daha kolaydı (p=0,023). İlk deneme yerleştirme başarısı LMA Protector için %75 iken, Baska mask için %84 idi. Toplam başarı oranları ise 2 cihazda da %91 idi. Nazogastrik tüp yerleştirmesi Baska mask grubunda hızlıydı [14 (12-15) kıyasla 17 (13-25) saniye; p=0,003]. Gruplar arasında fiberoptik görüntüler benzerdi. Yerleştirme sonrası dakika hacimleri LMA Protector grubunda daha fazlaydı [8 (6,5-10) L/dk'ya kıyasla 6 (5-7) L/dk; p<0,001]. Ekspiratuar tidal hacim, LMA Protector grubunda yerleştirme sonrası, yerleştirmeden 15 dk, 30 dk ve 45 dk sonra fazlaydı (p<0,001, p=0,032, p=0,001, p=0,027 respectively). End-tidal sevofluran konsantrasyonu (ETsevo) cihazın yerleştirilmesinden 30 dk sonra Baska mask grubunda yüksekti (1,49±0,38'e kıyasla 1,75±0,36; p=0,014). **Sonuç:** LMA Protector, yüksek tidal hacim sağlaması, azalmış optimizasyon manevrası gereksinimi ile retrograd üreteroskopide Baska maska üstündür.

Anahtar Kelimeler: Erişkin; laringeal maske havayolu; mekanik ventilasyon; üreteroskopi

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The Baska mask (Proact Medical Ltd, Northants, UK) is an uncuffed second-generation supraglottic laryngeal mask airway that has two channels; one for gastric aspiration and the other one for supraglottic aspiration. It is produced in 3 sizes; a size 3 (green) for average women, a size 4 (yellow) for average men or large women, and a size 5 (red) for large men. It is made from elastic silicone and it is designed for single use.[1]

The laryngeal mask airway (LMA) Protector is a cuffed second-generation laryngeal mask with a rigid curvature and 2 guidance channels. There are few clinical trials with the LMA Protector (LMA Company Ltd., San Diego, USA).[2,3]

To date, no randomized study has investigated and compared the ventilatory parameters of the LMA Protector and the Baska mask. We hypothesized that the LMA Protector would provide higher expiratory tidal volumes (TV) when compared to the Baska mask.

We primarily aimed to compare the tidal volumes between the LMA Protector and the Baska mask. Our secondary aims were to compare the ease of device insertion, duration of insertion times, nasogastric insertion times, ease of nasogastric insertion, oropharyngeal leak pressures (OPLP), peak airway pressures (P peak), Plato airway pressures (P plato), minute volume (MV), saturation (SpO_2), end-tidal carbon dioxide ($ETCO_2$), ETsevo, hemodynamic parameters and minor postoperative complications.

MATERIAL AND METHODS

Clinical Research Ethic Committee approved the study on February 4, 2019 with (KAEK 2019/68) number. Written informed patient consent was obtained from all patients. This trial was also registered to www.ClinicalTrials.com (NCT04186455). This trial was conducted between 5 December 2019-7 February 2022 at our university hospital in accordance with the Declaration of Helsinki. Adult patients between 18-70 years of age with American Society of Anesthesiologists (ASA) classification I-II, undergoing ureteroscopic surgery were enrolled in the LMA-Protector (n=32) or Baska mask (n=32) group. Randomization was started using randomization.org by a blinded anesthesia nurse in the preoperative area. Patients who had an American anesthesiologists physical status (ASA) 3-4, inter incisor gap<2.5 centimeters (cm), and had other difficult airway signs, and with a body mass index (BMI)>35 kg/m^2, or who were not-fasted, who had gastroesophageal reflux disease, hiatal hernia, history of esophageal or gastric surgery, who had an upper respiratory tract infection within the past week, and those who were pregnant were excluded from this study.

STUDY PROCEDURES

Patients were premedicated with intravenous midazolam (Demizolam; Teva İlaçları Sanayi ve Tic. A.Ş, Türkiye) 0.02-0.03 mg/kg after the patients were carried to the operating theater and standard anesthesia monitoring was applied including; SpO_2, electrocardiogram, with non-invasive blood monitoring every 5 minutes (min). Demographic variables like; age, gender, height, weight, BMI, ASA, medications, smoking and presence of gastritis were recorded. Airway characteristics of patients like; mallampati, inter incisor distance, thyromental and sternomental distance, mandibular protrusion, tooth morphology (full/lack/absent=prosthesis), and presence of hoarseness were also recorded. Operation time was recorded. Anesthesia was induced with fentanyl 1 µg/kg and propofol 2-3 mg/kg. When anesthesia deepened, then the designated airway device was inserted. A size 3 LMA Protector or green Baska mask was used for adults 30-50 kg, a size 4 LMA Protector or yellow Baska mask was used for adults 50-70 kg, and a size 5 LMA Protector or red Baska mask was used for adults 70-100 kg. A lidocaine spray was used on the posterior surface of the masks and for the drainage tubes. The LMA Protector and the Baska mask were inserted with the digital insertion technique in the sniffing position using a pillow. The cuff was inflated above the green region. Maneuvers to ease the insertion were applied randomly as follows; up-down, jaw-thrust, and head extension-flexion. All masks were stabilized with a band. All drainage tubes were taken from the refrigerator just before insertion. An experienced unblinded operator both for the LMA Protector and the Baska mask (used LMA>30 times) performed all

insertions. An independent observer collected the intra-operative and post-operative data. Then, 0.3 mg/kg rocuronium was administered to all patients for muscle relaxation after device insertion for the need of the surgeon. The number of insertion attempts, the need for maneuvers such as; up-down, jaw-thrust, head extension during insertion and achieving optimal ventilation from the laryngeal masks, ease of laryngeal mask insertion (very easy=no maneuver applied, easy=one maneuver applied, difficult=more than one maneuver applied, and impossible) were recorded. The insertion was recorded as a failure after 3 attempts and if ventilation was not effective. If LMA insertion failed then tracheal intubation was performed with a Macintosh laryngoscope (Avrasyamed Tıbbi Cihazlar ve Ürünler Paz. San. ve Dış Tic. Ltd. Şti, İstanbul, Türkiye). The insertion times of both devices were recorded starting from insertion into the oral cavity until the end-tidal carbon dioxide trace appeared. The 14 French nasogastric insertion time was measured starting from the handling of the nasogastric tube until insertion to the end. Appropriate insertion was evaluated by auscultation of the stomach with air injection from the nasogastric tube.

The fiberoptic view from the inserted laryngeal masks was also recorded by using a C-MAC fiberoptic cable attached to a 10-inch camera without the need for white balance (Karl Storz SE & Co. KG, Tuttlingen, Germany). Fiberoptic grades were recorded as; 1=full vocal cords, arytenoids, 2=vocal cords partially, 3=only epiglottis or 4=nothing could be seen. Hemodynamic parameters such as; heart rate (HR), SpO_2, and noninvasive blood pressure like diastolic blood pressure, and systolic blood pressure were recorded before anesthesia induction. HR, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure (MAP), SpO_2, $ETCO_2$, P plato, P peak, compliance, MV, and ETsevo concentration was recorded after anesthesia induction during face mask ventilation. OPLP, expiratory TV were added to these recordings after laryngeal mask insertion and at 15 minutes (min) intervals after device insertion until the end of the surgery. Insertion time of the LMA was evaluated as the time beginning from the device insertion into the mouth until optimal ventilation (occurring when the $ETCO_2$ trace and 7-10 mL/kg TV were achieved). Once optimal ventilation was achieved, OPLP was calculated by closing the expiration valve of the circle system at a constant gas flow of 3 L/minute (min) and with the airway pressure release valve fully closed. Anesthesia was maintained with 2% sevoflurane in a 40% oxygen and nitrous oxide mixture. Ventilation was performed by an anesthesia machine (Primus, Dräger Medical AG&Co., Lübeck, Germany) with a FiO_2 of 0.40 and a TV of 8 mL/kg at a respiratory rate (RR) of 12 breaths/min ($ETCO_2$ 35-40 mmHg), and with an inspiration/expiration ratio of 1/2 and 3 L/min of a fresh gas flow. If the $ETCO_2$ increased above 40 mmHg, RR increased to 14 breaths/min, then 16 breaths/min, and then TV was increased to 10 mL/kg. Ventilation was considered insufficient if $ETCO_2$>45 mmHg or impossible if $ETCO_2$>55 mmHg. If the SpO_2 level decreased under 95%, FiO_2 was increased to 0.5. If the SpO_2 was recorded as 90-94% the oxygenation was considered insufficient. If SpO_2 was <90% oxygenation was considered impossible. Patients were transferred to the postoperative care unit at the end of the surgery.

Before awakening, the patients received 4 mg ondansetron (Zofer®, Adeka İlaç San ve Tic, İstanbul, Türkiye) intravenously (IV), paracetamol 10 mg/kg (Parol 1,000 mg, Atabay Kimya Sanayi ve Ticaret A.Ş., İstanbul, Türkiye) IV, tramadol 1 mg/kg (Contramal, Abdi İbrahim İlaç Sanayi ve Ticaret A.Ş, İstanbul, Türkiye) IV and 20 mg tenoxicam IV (Tilcotil®, Deva Holding AŞ, Küçükçekmece, Türkiye). All patients received 2 mg/kg sugammadex (Bridion®, Merck Sharp Dohme İlaç Ltd. Şti., Türkiye). The drainage tube was removed before discontinuation of anesthesia. The LMA was taken off when the patient was able to open his/her mouth in response to a verbal command. Occurrences of aspiration, laryngospasm/bronchospasm, hypoxia (SpO_2<92%), cough, hiccup, blood seen on the device after removal, and lip/tongue/tooth damage were recorded. Hoarseness, dysphagia, nausea-vomiting, hypoxia (SpO_2<92%), and length of stay at the postanesthesia care unit were recorded. These symptoms were graded as positive/none.

STATISTICAL ANALYSIS

From a preliminary study, we performed in which a total of 10 patients enrolled, higher expiratory tidal volumes were recorded in the LMA Protector group than the Baska mask group (645±28.057 vs 610 ±46.489 mL). Based on these results, power analysis suggested that 32 patients per group (total of 64 patients) would be necessary for 95% statistical power and a Type 1 error of 0.05.

Statistics were analyzed by IBM SPSS for Windows 20.0 (IBM Corp., Armonk, NY, USA). Normality was assessed by the Shapiro-Wilk test. Normally distributed variables were expressed as mean±standard deviation (SD) and non-normal ones as median (25-75 percentiles). Independent samples t-test/Mann-Whitney U tests and chi-square tests were used whichever was appropriate. A p value <0.05 was considered significant.

RESULTS

A total of 210 patients underwent retrograde ureteroscopic surgery in this time period; 8 patients were under 18 years of age, 89 patients were ASA 3-4 and 14 patients declined to participate. And 43 patients could not be enrolled because of our unavailability to perform the trial. So, 64 patients were enrolled in this prospective randomized trial. The consort flow diagram of the trial is represented (Figure 1). The demographic variables were similar (Table 1). Airway variables of patients were comparable among the groups (Table 2). Operation time and the number of intubation attempts were

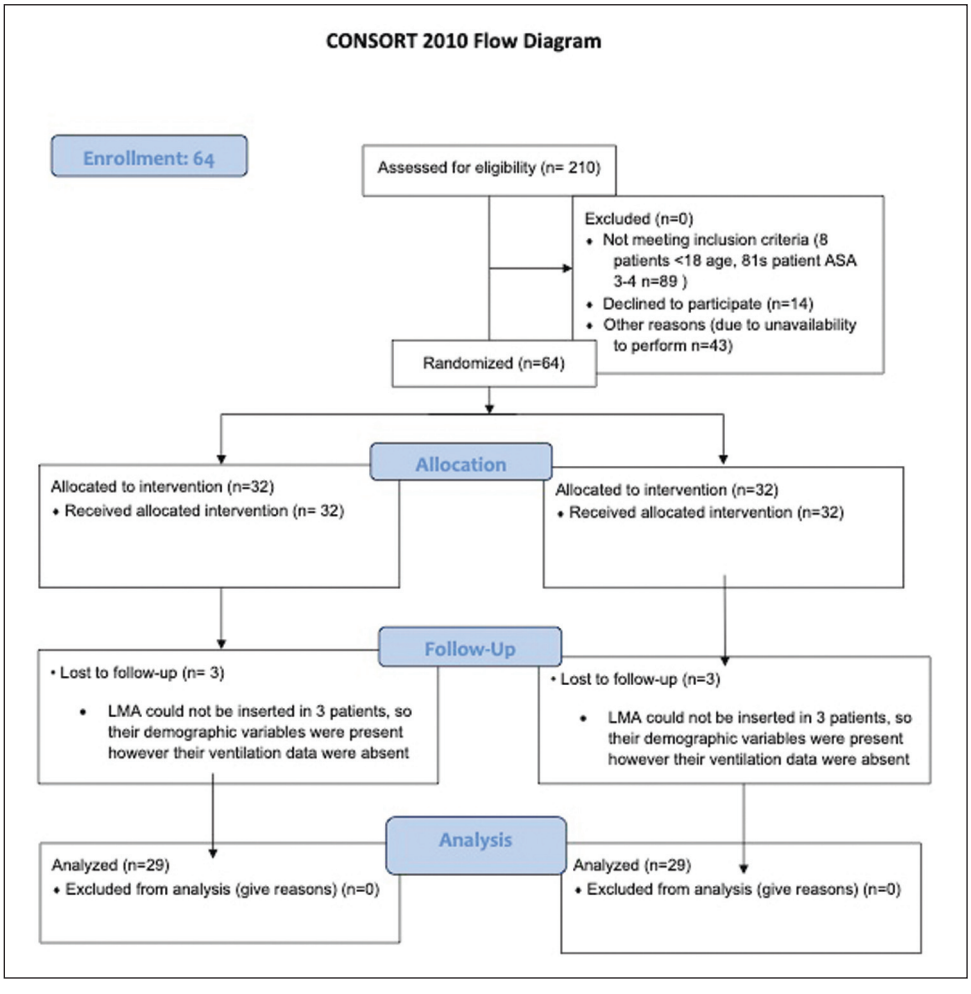

FIGURE 1: Flow diagram of the trial.
ASA: American Society of Anesthesiologists; LMA: Laryngeal mask airway.

TABLE 1: Demographic variables of the patients.

	LMA Protector (n=32)	Baska Mask (n=32)	p value
Weight (kg)	81.91±9.61	76.38±18.39	0.138
Age (years)	50.75±9.86	45.84±14.64	0.122
Height (cm)	170.81±8.20	169.03±8.06	0.384
BMI (kg/m^2)	29.34±4.28	29.38±5.69	0.980
Gender (F/M)	9/23	12/20	0.594
ASA I/II	10/22	15/17	0.305
Taking pills Y/N	9/23	9/23	1.000
Smoking Y/N	19/13	11/21	0.080
GastritisY/N	5/27	7/25	0.749

cm: Centimeter; kg: Kilogram; BMI: Body mass index; m: meter; ASA: American Society of Anesthesiologists; Y/N: Yes/no.
Values are mean±standard deviation (SD), or numbers. The explanations for the groups and the abbreviations in order of appearance and statistics.

TABLE 2: Patients' airway parameters.

	LMA Protector (n=32)	Baska Mask (n=32)	p value
Interincisor distance (cm)	4 [4-5]	4 [4-5]	0.340
Thyromental distance (cm)	8 [7-8.75]	8 [7-9]	0.939
Sternomental distance (cm)	15 [14-16]	15 [13-15.75]	0.349
Mallampati 1/2/3	13/19/0	17/14/1	0.318
Mandibular protrusion A/B	30/2	30/2	1.000
Tooth morphology Full/lack/absent	25/5/2	22/10/0	0.145
Hoarseness Present/absent	11/21	16/16	0.311

cm: Centimeter.
Values are median (1Q, 3Q) or numbers. The explanations for the groups and the abbreviations in order of appearance and statistics.

TABLE 3: Airway management variables of patients.

	LMA Protector (n=32)	Baska Mask (n=32)	p value
Operation time (minutes)	45 [40-55]	42.5 [40-62.5]	0.956
Number of insertion attempts 1/2/3	24/5/3	27/2/3	0.543
Maneuvers Up-down/jaw-thrust/head extension/ none	13/0/3/16	24/1/3/4	0.009*
Ease of LMA insertion Very easy/easy/difficult/impossible	16/13/0/3	5/23/1/3	0.023*
Insertion time (seconds)	20 [13-27]	14 [11-20]	0.035*
Nasogastric insertion time (seconds)	17 [13-25]	14 [12-15]	0.003*
Fiberoptic view 1/2/3	21/6/2	19/5/5	0.527

LMA: Laryngeal mask airway. *:p<0.05
Values are median (1Q, 3Q) or numbers. The explanations for the groups and the abbreviations in order of appearance and statistics.

similar between the groups (Table 3). The LMA Protector was inserted easier and required fewer optimization maneuvers than the Baska mask (Table 3). LMAs could not be inserted in 3 patients per group so, the perioperative airway and other parameters were analyzed in the 29 patients per group. LMA Baska mask insertion took less time than that of the LMA Protector [14 (11-20) vs 20 (13-27)

TABLE 4: Perioperative ETsevo concentrations.

	LMA Protector (n=29)	Baska Mask (n=29)	p value
After anesthesia induction	1.3 [1.0-1.6]	1.3 [1.0-1.75]	0.919
After insertion	1.43±0.55	1.45±0.46	0.857
15 min after insertion	1.51±0.43	1.61±0.28	0.294
30 min after insertion	1.49±0.38	1.75±0.36	0.014*
45 min after insertion	1.46±0.4	1.72±0.44	0.097

L: Liters; Etsevo: End-tidal sevoflurane concentration; min: Minutes.
Values are mean±SD or median (1Q, 3Q). *:p<0.05

TABLE 5: Mechanical ventilation parameters of patients.

		LMA Protector (n=29)	Baska Mask (n=29)	p value
MV (L)	After anesthesia induction	7 [5-12.5]	7 [5-9]	0.617
	After device insertion	8 [6.5-10]	6 [5-7]	<0.001[&]
	15 min after insertion	7.14±1.38	6.59±1.21	0.111
	30 min after insertion	7 [6-8]	6 [5-7]	0.118
	45 min after insertion	6.63±1.09	6.6±1.24	0.953
Expiratory TV (mL)	After anesthesia induction	510.5±164.73	478.28±126.17	0.383
	After insertion	637 [604-665.5]	590 [494.5-623.5]	<0.001[&]
	15 min after insertion	652 [608.5-665.5]	620 [552-655]	0.032*
	30 min after insertion (mL)	648.58 ±48.37	578.08±85.88	0.001*

[&]p<0.001; *p<0.05; MV: Minute volıme; TV: Tidal volume; min: Minutes; mL: Milileter.
Values are mean±standard deviation (SD), or numbers or median (1Q, 3Q).

seconds, p=0.035] (Table 3). Nasogastric tube insertion time was shorter in the Baska mask group when compared to the LMA Protector [14 (12-15) seconds versus 17 (13-25) seconds; p=0.003]. Fiberoptic views were comparable among the groups (Table 3).

ETsevo concentration was lower at the 30th min recordings in the LMA Protector group (Table 4). Oropharyngeal leak pressures, plato pressures, peak airway pressures, compliance, $ETCO_2$, SpO_2 values were similar after device insertion and 15 min, 30 min, 45 min after device insertion. MV vaules were higher in the LMA Protector after device insertion (Table 5). Tidal volumes were higher in the LMA Protector group in all time measurements (Table 5). Perioperative HR and MAP recordings of patients were found to be similar between the groups. Groups were comparable regarding sore throat, cough, dysphagia, hoarseness, blood staining on the device. There was no lip or tongue, or teeth damage occcur in any patient.

DISCUSSION

The demographic and airway variables, and operation time that could affect the sealing parameters were similar between the groups. This allows us to compare the LMA Protector and Baska mask with increased value. The important result of this study was that the LMA Protector reached higher expiratory tidal volumes when compared to the Baska mask. Even with the similarity in the number of intubation attempts and the higher frequency of the need for optimization maneuvers in the Baska mask group; the insertion time of Baska masks was shorter than in the LMA Protector group. This was due to time passing for the cuff inflation of the LMA Protector. The groups were comparable regarding other ventilation parameters.

A study found the insertion time to be 7 s, however, they did not confirm ventilation in females.[4] Insertion time of the Baska mask took 14 s in our study which was identical to previous literature that

found 14-16 s insertion times for the Baska mask.[1,5-8] Some other studies showed 21-24 s insertion times for the Baska mask.[9-11] This demonstrates that Baska mask insertion times can vary quite a bit. This decreased insertion time of the Baska mask was due to the thin and elastic uncuffed structure of the Baska mask.

Insertion time was found to be 5 seconds for the LMA Protector because they did not confirm the ventilation with the $ETCO_2$.[12] This was lower than other supraglottic airway devices (SADs) insertion times mentioned previously.[13-16] Consistent with our results, the LMA Protector was inserted in 19-29 seconds in the previous studies.[3,17] We found the insertion time to be 20 s for the LMA Protector in our study. The rigid curvature of the LMA Protector made it difficult to overcome the oropharyngeal and nasopharyngeal structures and prolonged the insertion process.

Oropharyngeal leak pressures of the Baska mask were reported between 28-40 cmH_2O in patients who had undergone urological operations, for both genders, not paralyzed.[4-6,8-10,18-20] The OPLP of females was higher than men. This was because the yellow Baska mask fits better in females when compared to normal-weight men.[3,10,19] The OPLP of the Baska mask was a maximum 25 cmH_2O in our study, and this was because of the higher male population than female population in our study.

Previously published trials reported the OPLP between 18-32 cmH_2O for the LMA Protector.[2,3,12,21-23] No neuromuscular agent was used in these previous trials. However, we used a neuromuscular agent in our trial after device insertion. The OPLP of the LMA Protector was 31 cmH_2O when the cuff was set at 60 cmH_2O in all subjects.[2] We recorded 21 cmH_2O OPLP for the LMA Protector in our study. The effect of different cuff volumes on the OPLPs of the LMA Protector was evaluated in a recently published study. They demonstrated that if the cuff was inflated to 20 mL the OPLP was>25 cmH_2O.[17] We inflated the cuff until the green line; perhaps we injected a volume lower than 20 mL. So, this would be caused a lower OPLP for the LMA Protector in our trial. The OPLP was 34 cmH_2O with the head in the neutral position for the LMA Protector and when the cuff pressure was set at 55 cmH_2O. They also demonstrated that the OPLP was higher in women when compared to men.[24] The male population was higher in our trial so the OPLPs were lower than in the literature.

The first attempt insertion success rate of the Baska mask was 73-99% in previous studies.[1,4,5,7-11,18-20,25] The overall success rate of the Baska mask was 92-100% in published reports.[4,5,7-11,18-20] Similar to ours, they used the green Baska mask for patients <50 kg, the yellow one for patients 50-70 kg, and the red one for patients >70 kg.[18,19] We found the first attempt success rate of the Baska mask as 84% and the total as 91% in our study.

The first attempt insertion success rate was 72-90% in the literature.[2,3,12,17,23,24] The overall sucess rate was shown to be 99-100% for the LMA Protector recently.[2,3,12,17,23,24] We found the first attempt success rate of the LMA Protector as 75% and the total as 91% in our study in experienced hands.

In the Baska mask group 20-35% of patients required optimization maneuvers in the Baska mask group.[9,11] Supplemental maneuvers were required in 44% of the cases and this was mostly the insertion of the device deeper into the hypopharynx (up-down) for the Baska mask in previous literature.[5,18] They used maneuvers of increasing the depth of the laryngeal mask (inserting further in), withdrawal of the device, and rotation of the device.[18,19] The Baska mask required maneuvers for 88% of patients and the LMA Protector required maneuvers for 50% in our study.

The fiberoptic view 1-2 was found as 60-90% in published trials.[5,6,18] The fiberoptic view 1-2 was 75% and no glottis view was 16% in the Baska mask group in our study. Vocal cords were visible 82-100% in a previously published study and 84% in our study with the LMA Protector.[3,24]

Consistent with our findings, gastric access was easily inserted in all cases through the Baska mask in the other manuscripts.[5,8,18] The gastric tube insertion rate was 96-100% for the Baska mask.[3,12] The gastric tube was inserted successfully in all subjects from the LMA Protector like most of the second-generation SADs.[13-16,26]

There are some restrictions; firstly the operators were not blinded to the devices so this study was single-blinded. Secondly, the patients had normal airways and normal weight. Thirdly, we administered

a neuromuscular blocker after device insertion to all patients. Fourthly, the operators were experienced using both devices. SAD insertion depends on the experience of the provider.[27,28] These results would be different in laparoscopic surgery or in patients who were not paralyzed. Therefore, our results could not be applied to first-time device users. On the other hand, these results could be generalized to all lower abdominal surgery patients.

CONCLUSION

The LMA Protector is superior to the Baska mask regarding providing higher tidal volumes and decreased need for optimization maneuvers in retrograde ureteroscopic surgery.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Enes Malik Akdaş;* ***Design:*** *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Enes Malik Akdaş;* ***Control/Supervision:*** *Zeynep İpek Arslan;* ***Data Collection and/or Processing:*** *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Enes Malik Akdaş;* ***Analysis and/or Interpretation:*** *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Enes Malik Akdaş;* ***Literature Review:*** *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Enes Malik Akdaş;* ***Writing the Article:*** *Zeynep İpek Arslan, Huri Yenidal, Merve Yazıcı Kara, Sibel Balcı, Enes Malik Akdaş;* ***Critical Review:*** *Zeynep İpek Arslan, Sibel Balcı;* ***References and Fundings:*** *Zeynep İpek Arslan, Enes Malik Akdaş;* ***Materials:*** *Zeynep İpek Arslan.*

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