

rupture. The LMA Protector is a recently introduced SGD (www.lmaco.com/products/lmaAE-protector-airway-cuff-pilot-technology), which allows controlled ventilation, provides a gastric access port and features a conduit for endotracheal intubation, if required (Fig. 1).

Method: We present a series of 4 cases scheduled for elective endovascular aneurysm coiling under general anesthesia where the LMA Protector was used for airway management. Patients included had no history of aneurysm rupture or subarachnoid hemorrhage. Controlled ventilation was instituted after device insertion and performance tests verified good placement. Patient demographic data, ventilator parameters, and adverse events are shown in Table.

Results: The studies and aneurysm treatments were completed without incident and periods of apnea were performed as needed. All patients emerged quickly from anesthesia with minimal coughing and response to commands.

Conclusions: In carefully selected patients the LMA Protector Airway can be an effective alternative to ETT for cerebral aneurysm coiling. Adequate ventilation was achieved and placement of ETT via the device was not necessary but could have been performed in case of aneurysm rupture. Further randomized trials are needed to provide validation for the use of this device.

References:

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[SNACC-104] Predicting Loss of Consciousness Using the Pupillary Light Reflex

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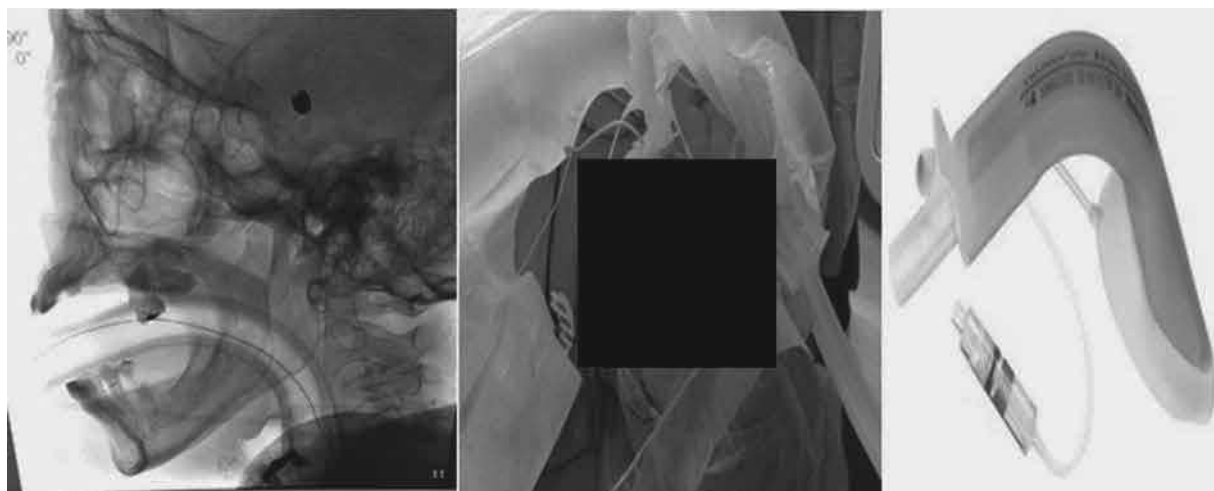
Background: Defining the moment of loss of consciousness is not a consensual. In the clinical practice it is often assessed using clinical endpoints, but in some studies, pharmacokinetic or EEG-derived parameters have been used. The assessment of clinical endpoints can reflect either cortical, subcortical/brainstem and/or spinal functions. From the several brainstem¹ reflexes described, one that can eventually be used for this purpose is the Pupillary Light Reflex (PLR). PLR is useful, as it reflects the actions of the anesthetics along the 4 different

Table 1: Univariate analysis by vasospasm outcome. Categorical variables are represented as number (percent). Continuous variables are represented as (Mean±SD). Variables which are not normally distributed are presented as median and IQR (25%-75%). P<0.05 is statistically significant. IVA= Intravenous anesthesia. VA= Volatile anesthetic. H and H grading= Hunt and Hess grading.

Characteristic	Vasospasm (n=97)	No Vasospasm (n=60)	P value
Anterior circulation n(%)	84(87%)	44(73%)	0.037
Clipping n(%)	47(49%)	18(31%)	0.027
Inhalational anesthetics used n(%)	66(70%)	44(88%)	0.042
Half IVA/ Half VA used n(%)	27(28%)	5(8%)	0.003
Diabetes n(%)	8(8%)	15(25%)	0.004
H and H grading (Mean±SD)	3.11±.98	2.71±1.004	.02
Total hospital length of stay (Median/IQR)	19/14-24	16/10.25-24.5	.004

Table 2: Logistic regression analysis for the predictors of vasospasm after SAH. Values are represented as odds ratio and 95% confidence interval. P<0.05 is statistically significant.

Characteristic	Odds ratio	95% Confidence Interval	P value
Diabetes	.2	.07-.6	.004
Inhalational anesthetics	.35	.14-.88	.026



	Patient 1	Patient2	Patient3	Patient4
Age	75	54	52	65
Sex	F	F	F	M
BMI	25[1.4-56]	27[1.5-65]	28[1.6-74]	23[1.8-81]
Site of Aneurysm	Lt P.com	Lt ICA	Lt MCA	Lt P.com
LMA protector size	4	4	4	5
Insertion Attempts	1	1	1	2
Tidal Volume	348	408	474	390
Peak airway pressure	17	20	12	14
Minute ventilation	3.8	4.7	5.6	5.4
End tidal CO ₂	30	33	34	40
Procedure duration	170	150	135	210
Adverse events	Nil	Nil	Nil	Blood tinged secretions on removal

synopsis of the reflexes across the central nervous system. Opioids affect pupil size, but do seem not alter light reflex amplitude or constriction velocity and propofol decrease both the amplitude of the light reflex independently of any change in pupil size.²

In this study, we wanted to assess the possibility of using different characteristics of the PLR to predict loss of consciousness.

Methods: This is an observational prospective study, where 25 consecutive patients were enrolled. Patients scheduled for neurosurgical procedures, with general total intravenous anesthesia with propofol and remifentanyl were considered when no premedication was used. The PLR was measured using a portable infrared pupillometer (AlgiScan—IDMed, France) before and after loss of consciousness was achieved. The pupillometer applied a flash of visible light and measured the minimum diameter obtained afterwards, the response latency and velocity of contraction. A logistic regression for loss of consciousness was then calculating using these 3 variables. Data are presented as mean \pm SD.

Results: The logistic regression model showed goodness of fit (Hosmer and Lemeshow test $P=0.921$). Velocity of contraction was statistical significant ($P<0.001$, Exp(B) 0.98).

Receiver operating characteristic curve of the predicted probabilities yielded an area under the curve of 0.982 ($P<0.001$) (Fig. 1).

Discussion: From this preliminary results, it seems that some measurements related to the PLR can be used to detect loss of consciousness. However, further studies are needed to assess if it correlates with the time it ensues.

References:

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[SNACC-105] Pupillary Pain Index correlates with Postoperative Pain Scores in Neurosurgical Patients

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Background: Acute postoperative pain, if inadequately treated, not only limits mobility and impairs ventilation, but also increases stress hormones and the risk for chronic postsurgical pain.¹ In contrast, if opioids are given in excess they can cause respiratory depression, nausea and vomiting, ileus, sedation and even hyperalgesia.¹

Adequate titration of analgesia intraoperatively lacks a widely accepted monitor. Nevertheless, some studies have addressed this issue by using surrogate variables of the autonomic nervous system to guide opioid administration.^{2–3} In this study, we recorded the pupillary dilation response immediately before extubation and compared it with the ratings of patient's pain reported in the postanesthesia care unit (PACU) using a visual analog scale (VAS).⁴

Methods: Pupillary dilation response was determined through pupillometry using AlgiScan and its Pupillary Pain Index (PPI). The PPI consists in measuring the changes in pupillary dilation in response to a continuously increasing electric stimulus discharge, which then assigns scores from 1 (when pupillary dilation is $<5\%$ despite maximal tetanic stimulation intensity) to 10 (when pupillary dilation rises above 13% with the 10 mA).³ Twenty-two patients undergoing neurosurgery were included in this study. General anesthesia was induced and maintained with propofol and remifentanyl, titrated to achieve adequate levels of sedation and analgesia during the medical procedure. PPI measurements were performed after propofol was stopped at the end of surgery and before extubation. VAS pain assessment was performed at PACU arrival. Correlation analysis between PPI and VAS was assessed using 2-tailed Spearman test with significance for $P<0.01$. Data are presented as mean \pm SD.

Results: Demographics were: 57 ± 13 years, 68.3 ± 9.1 kg, 163 ± 8 cm, 9% ASA I, 82% ASA II, 9% ASA III, 15 females and 7 males. Mean PPI before extubation was 6.2 ± 2.5 and VAS at PACU arrival was 5 ± 2.6 . VAS was correlated with PPI (Spearman $R=0.57$, $P=0.006$), and could be predicted (adjusted $R^2=0.41$) as $VAS=0.79 \times PPI + 0.046$.

Conclusions and Discussion: We found a correlation between pre-extubation PPI and the VAS at PACU arrival. This data suggest that PPI could be used to titrate analgesia in the end of the intraoperative period, targeting optimal analgesia in the immediate postoperative period.

References:

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