

# The success rate of using a video laryngoscope in combination with a single-handed steerable introducer for rescue intubations. A six-year review.

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## Introduction

A direct laryngoscope (DL) or video laryngoscope (VL) is used to visualize the glottis in routine intubations. Conventional tracheal access equipment is static and cannot actively be steered while in use. VL and DL attempts can fail, increasing risks of harm. Failure to intubate with DL is mainly failure of visualization while failure to intubate with VL is mainly failure of tracheal access.<sup>1</sup>

Advanced intubation equipment: intubating supraglottic airways, flexible intubating scopes (FIS), and optical stylets, can be used for rescue after failed VL and DL. Reported rates of failure to rescue with advance equipment is 22% -32%<sup>2</sup>

A combined technique using VL for visualization and FIS as steerable introducers for tracheal access is recommended by the ASA difficult intubation guidelines as a rescue technique.<sup>3</sup> The randomized controlled trial supporting this combined technique used the FIS only as a blind steerable introducer, all visualization was from the VL.<sup>4</sup> A FIS is not necessarily immediately available in the operating room due to expense and equipment footprint. Addition, a FIS takes two hands to control the flexible shaft and articulate the tip, necessitating two operators for execution of this combined technique. These shortcomings related to the FIS may limit clinical use of combined techniques for rescue.

A novel single-handed steerable introducer built specifically for use with VL (Runnels Steerable Introducer™ (RSI™), TTCmed.com Salt Lake City, UT) is available.<sup>5</sup> The RSI™ has a removable pistol grip handle and trigger that controls tip articulation and a flexible shaft enabling active serpentine navigation during tracheal intubation allowing single operator combined technique for difficult intubations. (See figure 1.) Left hand VL, right hand single handed steerable introducer.



Figure 1. Single-handed steerable introducer with flexible shaft, articulating tip, and removable handle. (RSI™; TTCmed.com, Salt Lake City, Utah)

## Methods

Retrospective electronic medical record review.

After IRB approval, 27841 consecutive airway notes from a single large teaching hospital from December 2017 to September 2023 were searched for the use of VL in combination with an RSI™ after failed intubation attempts using VL, DL or both. 148 cases with steerable introducer rescue attempts were identified. These cases were then evaluated for successful endotracheal tube intubation on first attempt, on second attempt, or failure to intubate the trachea. In cases of failure to intubate with a steerable introducer, the ultimate successful rescue technique was noted.

Results (See Table 1)

RSI™ rescue after	First pass success rate	Second pass success rate	Overall success rate	Failed rescue	Ultimate successful technique
Failed DL	21/24 (87.5%)	3/3 (100%)	24/24 (100%)	0	N/A
Failed VL	58/66 (87.8%)	1/8 (12.5%)	59/66 (89.4%)	7/66 (10.6%)	4 with FIS: 2 with DL: 1 bougie
Failed VL with 2 attempts	21/24 (87.5%)	3/3(100%)	24/24 (100%)	0	N/A
Failed VL and DL	32/34 (94.1%)	No second attempts	32/34 (94.1%)	2/34 (5.9%)	2 with FIS
All rescue attempts	132/148 (89.1%)	7/17 (41.1%)	139/148 (93.9%)	9/148 (6.1%)	

Table 1 Success and failure rates for rescue attempts with VL and a single-handed steerable introducer after failed VL and DL.

## Conclusion

A single operator combined technique using VL and an RSI™ is a feasible rescue technique after failure of routine VL and DL. This single operator combined technique is associated with higher rates of first pass success and ultimate success when compared to other advanced rescue techniques.

## References

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