

Remifentanil Procedural Sedation in ICU for EGD in Bleeding Patient with IABP

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Case History

44F in DKA with newly diagnosed DM (A1c >14), bilateral pleural effusions, bilateral DVTs, nonischemic cardiomyopathy (LHC showed non obstructive CAD, TTE LVEF severely reduced 10-15%, RV moderate to severe systolic dysfunction, apical septal thrombus). An IABP and R chest tubes were inserted, and anticoagulation was initiated. She began passing melanotic stools on anticoagulation with Hgb nadir 7.6 from 12.6. Patient had a MP IV airway and risk factors for OSA. She was scheduled for EGD in ICU.

The Challenge

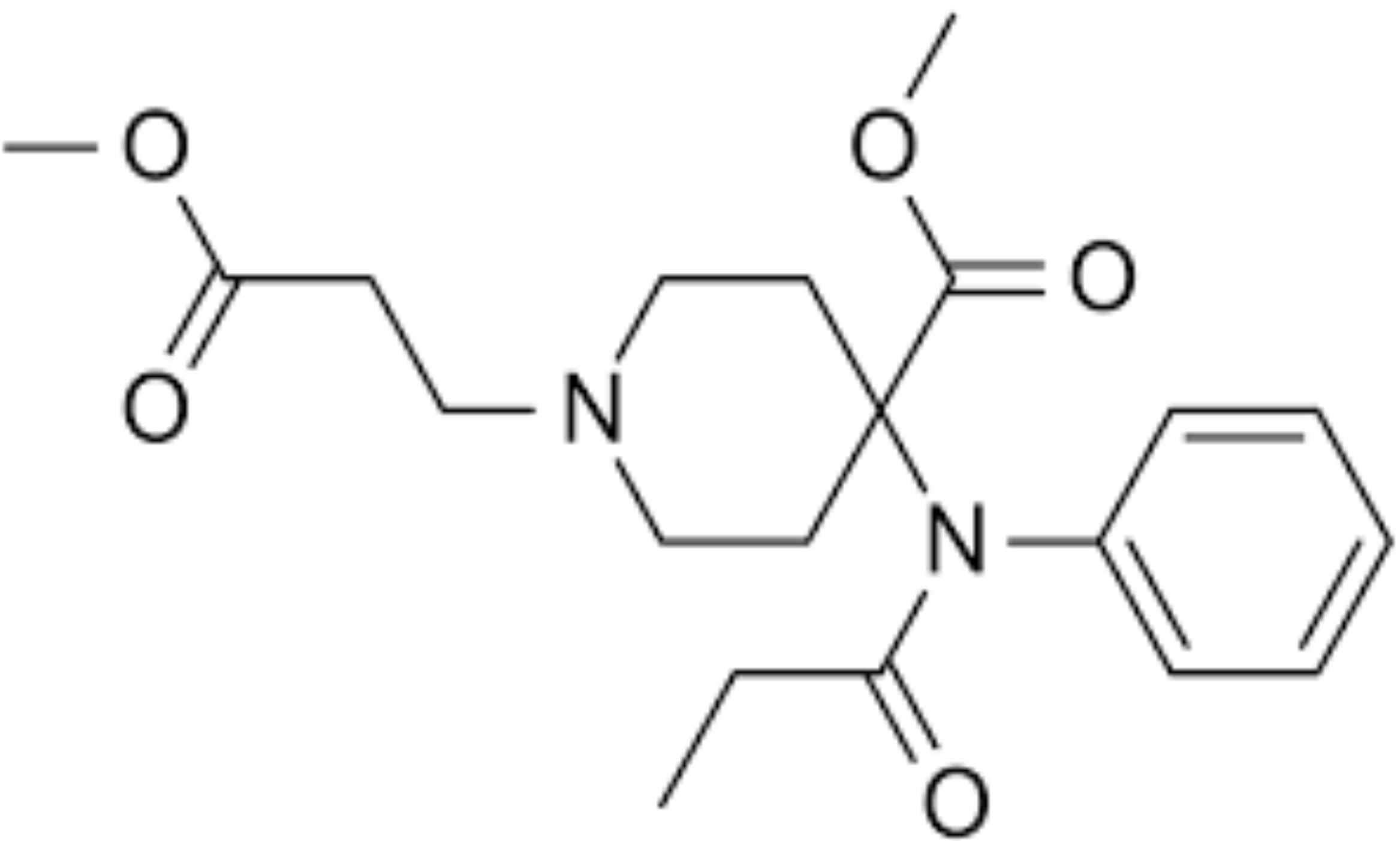
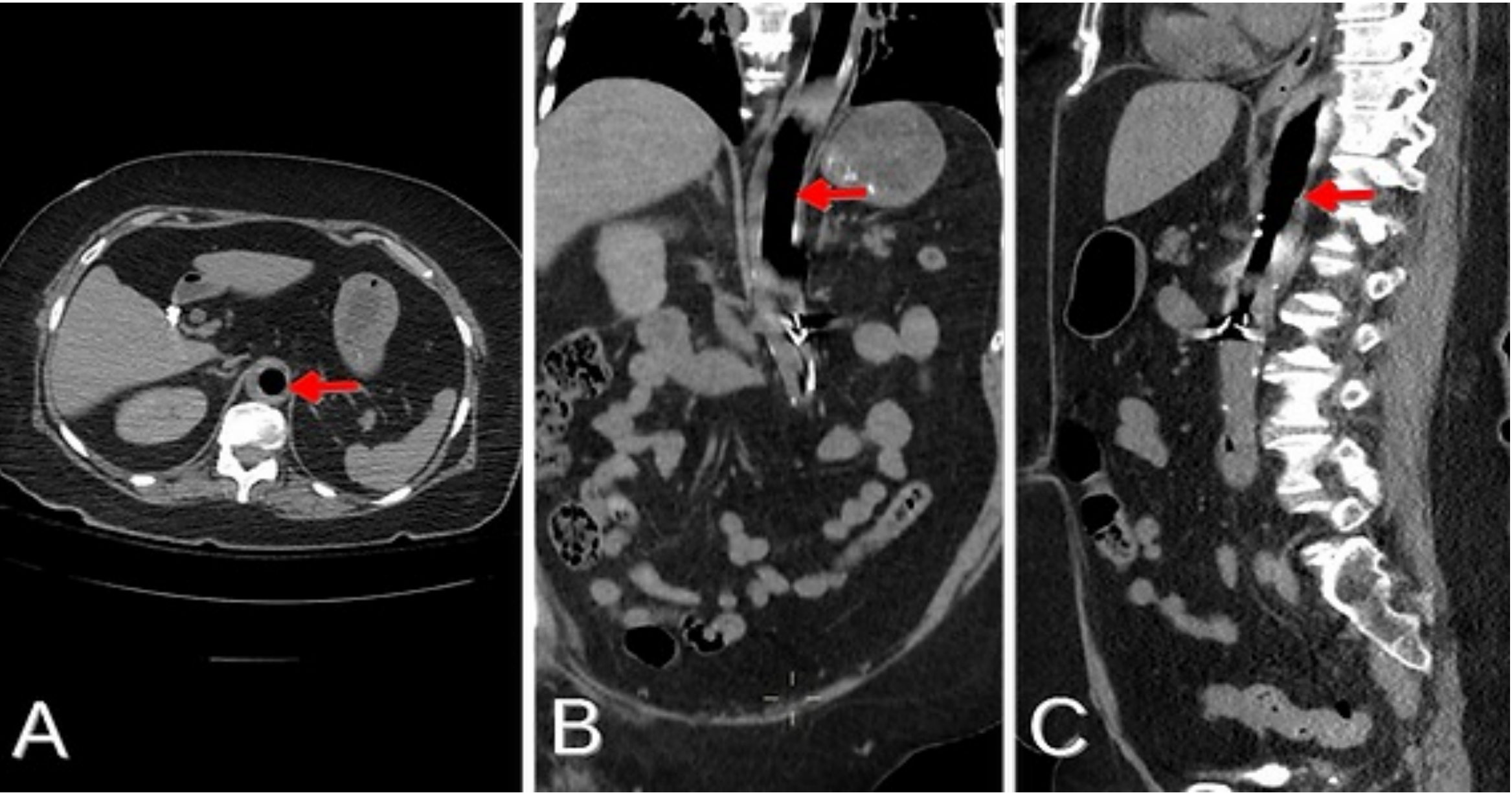
NORA sedation is challenging due to distance from the operating rooms and anesthesia support, limited room space, as well as unfamiliarity of nursing staff with our procedures and needs. In this case we have a bleeding patient with non-reassuring airway who requires IABP with biventricular dysfunction. She is acidotic with electrolyte abnormalities stemming from DKA and uncontrolled diabetes. The case is emergent given the need to control the ongoing bleeding versus the need to continue anticoagulation.

Surgical Course

A-line and CVC were in situ. O2 NC with capnography was continued at 4 L/min.

Topicalization was performed with 20% Benzocaine. The anesthetic goals were to maintain spontaneous ventilation while avoiding hypercarbia, hypoxia, and hypotension in this acidotic patient with biventricular dysfunction and a non-reassuring airway. Sedation was initiated with Propofol 75 mcg/kg/min and Remifentanil at 0.08 mcg/kg/min.

The EGD was performed and a single 15-20 mm ulcer was seen in the lesser curvature of the gastric body.



Discussion

Remifentanil has unique pharmacokinetic properties that make it an easily titratable drug. Remifentanil is a μ -opioid receptor agonist that is quickly metabolized by non-specific esterases in tissues and blood. It's major metabolite, remifentanil acid, is an inactive compound and undergoes renal excretion.

Research on remifentanil usage outside the OR is currently in the early stages. In a meta analysis conducted by Tan et. all, eleven randomized control trials compared remifentanil with another opioid or hypnotic agent in 1067 critically ill patients. Remifentanil was associated with faster extubation times after cessation of sedation. In another study performed by Kisilewicz et. all, remifentanil use in the ED for procedural sedation was studied and demonstrated faster patient recovery times and procedure completion times.

The issue with both studies however was a lack of high quality data secondary to small sample size.

Nonetheless this will change as we start seeing more remifentanil use outside the OR.

Conclusion

Remifentanil continues to be a valuable sedative agent for anesthesiologists. Its unique chemical properties allow for its quick onset and offset of action; all while providing analgesia and maintaining a relatively benign side effect profile. As more studies continue to show its versatility in different patient populations, expect to see an increase in usage at sites outside the OR including the ED, ICU, endoscopy suites, etc.

References

Atterton, B., Lobaz, S., & Konstantatos, A. (2020, September 1). *Remifentanil use in anaesthesia and critical care*. WfSA Resource Library. <https://resources.wfsahq.org/atotw/remifentanil-use-in-anaesthesia-and-critical-care/>
Kisilewicz M, Rosenberg H, Vaillancourt C. Remifentanil for procedural sedation: a systematic review of the literature. Emerg Med J. 2017 May;34(5):294-301. doi: 10.1136/emermed-2016-206129. Epub 2017 Mar 1. PMID: 28249938.
Tan JA, Ho KM. Use of remifentanil as a sedative agent in critically ill adult patients: a meta-analysis. Anaesthesia. 2009 Dec;64(12):1342-52. doi: 10.1111/j.1365-2044.2009.06129.x. Epub 2009 Oct 22. PMID: 19849681.