Case report

Combined local anesthesia and monitored anesthesia care for cochlear implantation

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A R T I C L E   I N F O

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A B S T R A C T

Introduction: Cochlear implantation has become a routine procedure for patients with hearing loss. In some patients, general anesthesia might be contraindicated due to multiple co-morbidities. We describe a successful protocol for cochlear implantation under local anesthesia with light sedation.

Case report: An 81-year-old patient presented with profound sensorineural hearing loss. Her past medical history revealed ischemic coronaryopathy, managed by stenting. After multidisciplinary evaluation and clear adapted information to the patient, surgery was performed under local anesthesia with light sedation and monitored anesthesia care. The procedure lasted 70 min, and was without incident and under good conditions for the surgeon. During the intervention, the patient was comfortable. No nausea or vomiting was noted. The postoperative period was smooth and uneventful.

Conclusion: We find local anesthesia with light sedation a good alternative to general anesthesia for patients where general anesthesia is contraindicated. An experienced surgical and anesthesiology team is essential to shorten the duration of the procedure.

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1. Introduction

In the past, cochlear implantation (CI) was not considered for elderly patients, as the benefit was thought to be significantly less than that generally obtained in younger adult patients. This was attributed to physiological deterioration of cognitive abilities in the elderly, which may have an impact on the capacities of speech perception with CI. Other concerns were the tolerance of general anesthesia, risk of postoperative complications and the difficulties in manipulation of the external components of the device [1].

However, in more recent literature, CI in the elderly resulted in speech perception abilities comparable to those of younger CI recipients as well as measurable improvements in depression and loneliness [2,3].

Age should not be a contraindication when considering a patient for CI, as authors found an improvement in postoperative quality of life in patients implanted after the age of 75 [4].

As general anesthesia (GA) is routine practice over the world for ear surgery, local anesthesia (LA) is often overlooked. However, LA along with intravenous sedation and analgesia delivered under the care of an anesthesiologist (monitored anesthesia care: MAC) has been the standard of care in our department for otosclerosis surgery with excellent results in cooperative adult patients [5,6].

In this article, we describe our protocol of combined LA with MAC to reduce the need for GA in CI surgery.

2. Case report

We present a case report of CI under LA with MAC in an 81-year-old woman who presented to our clinic with progressive bilateral sensorineural hearing loss (SNHL).

Her past medical history was marked by essential hypertension, dyslipidemia and stented coronary artery disease. Audiometric studies showed severe bilateral SNHL: 90 dB HL and 20% speech discrimination at 60 dB under best-aided conditions using monosyllabic words. Preoperative cardiology consultation revealed no evidence of cardiac ischemia.

As for all patients in our center, other pre-implant evaluations were performed, such as vestibular studies, CT scan of the mastoids, magnetic resonance imaging, and speech therapy and psychological assessments. No contraindication for CI was found.
Because of the increased cardiovascular risk with GA, we decided to avoid GA for this patient and perform the implantation under LA with MAC.

2.1. Anesthesia protocol

Details of the intervention were explained to the patient in the pre-anesthesia clinic. The patient was pre-medicated the night before and on the morning of surgery with oral hydroxyzine at a dose of 0.5 mg/kg. Peri-operative monitoring was performed in a standard manner with electrocardiogram, pulse oximetry and non-invasive blood pressure monitoring. Oxygen was delivered at 2–3 L/min through nasal cannula. The retro-auricular region was injected with 1% lidocaine and 1:100,000 epinephrine. Small doses of midazolam (0.5 to 1 mg) and sufentanil (2.5 to 5 μg) were administered intravenously. Further similar boluses of sufentanil and midazolam were titrated to patient comfort. A dose of 0.625 mg of droperidol was administered as a prophylactic anti-emetic at the beginning of the procedure and a further 0.625 mg before opening the round window. Toward the end of the procedure, a small bolus of intravenous urapidil was used for blood pressure control.

2.2. Surgery protocol

The surgical steps were performed according to the standard technique used in our center. Under monitoring of the facial nerve, a retro-auricular C-shaped incision, mastoidectomy and posterior tympanotomy with round window insertion technique were performed. The CI device was used was the MedEl® Concerto.

The procedure lasted 70 min from skin to skin. During the procedure, the patient was comfortable. No nausea or vomiting was noted even during the round window opening. Dressing and recovery room care were done as usual. The postoperative period was smooth and uneventful.

The patient was discharged on postoperative day 1 and then seen on day 7 for local care of the operating site and then at 3 weeks for the first activation of the device.

3. Discussion

We describe a protocol of combined LA with MAC to reduce the need for GA. By using this technique, we successfully performed CI in a high cardiovascular risk 81-year-old recipient.

Possible concerns in operating on elderly patients may be the associated co-morbidities and the risk of anesthetic and other peri-operative complications. However, recent evidence suggests that life-threatening complications of CI are rare and the surgery is usually safe. In a retrospective study conducted on 70 elderly patients (mean age, 77 years), only three patients (4%) were found to have anesthesia related complications: delayed extubation, congestive heart failure and urinary retention, respectively. All three patients were classified as ASA III or IV. No long-term morbidity or mortality was reported [7].

Recent evidence showed many advantages of CI in the elderly [2] but non-surgical contraindications in this category of patients might be an obstacle to implantation. By reviewing the literature, little is found on CI under LA in the elderly [8,9]. Different techniques have been described for CI under LA to shorten surgical time. However, with an experienced surgeon, we were able to perform the intervention within an acceptable timeframe compared to the literature data [10].

Performing the surgery under LA may generate pain and anxiety and lead to tachycardia, hypertension and ultimately cardiac ischemia, especially in patients with underlying heart disease. This is why we chose MAC, where the LA is supplemented with small doses of sedatives and analgesics to ensure patient comfort, while maintaining visual contact with the patient. Because of these patients’ SNHL, drilling-induced anxiety is fortunately not a problem. Experience of the surgical team is also important to keep potentially long procedure times to a minimum.

We used a combination of a benzodiazepine and an opioid that we find very effective in other types of ear surgery. With the small doses used, respiratory depression does not seem to be a problem even in older patients. Droperidol, a neuroleptic, has the advantage of providing added sedation as well as anti-emesis.

Maintaining patient interaction is essential, as unexpected actions are unpleasant and frustrating for the surgical team. In the postoperative period, LA also has the advantage of inducing less nausea and vomiting than GA, which is very appreciated by patients.

We find local anesthesia with monitored anesthesia care a good alternative for patients who are at possible risk for general anesthesia. An experienced surgical and anesthesiological team is essential to shorten the duration of the intervention.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References