Surgical approaches to the inner ear and internal auditory canal (IAC) are widely known and extensively recorded. The most popular can be classified as retrosigmoid, transmastoid, translabyrinthine, and middle cranial fossa approaches. For the first time, a transluminal endoscopic surgery: Where should we draw the line? Surgical operation During surgery, various rigid endoscopes (Karl Storz, Tuttlingen, Germany) were used for all of the procedures. A circumferential tympanomalatal flap was created in the external auditory canal (EAC) with a round knife using the 0° endoscopic view, 3 cm from the tympanic membrane; the tympanomalatal flap was then elevated detaching the annulus from the bony ring, and the flap, pedicled on the umbra, was transposed laterally and then detached from the malleus using a microscissor. In this way, it was possible to remove all of the ear canal with the skin flap at the EAC, which was preserved in a saline solution (Figure 2, Panel A). To gain optimal surgical access to the entire medial wall of the tympanic cavity, the annulus was drilled until the hypotympanum and the prepyriformly, so as the eustachian tube was directly visible under 0° endoscopic view. After this procedure, good control of the tympanic cavity was achieved, and the anterior canal, promontory region, prepyriform, and hypotympanum were easily exposed endoscopically (Figure 2, Panel B). Then, using a diamond bur under 0° endoscopic view, the scutum was partially removed, exposing the incudomesial joint. The incus was then removed maintaining the integrity of the stapes, and the malleus was removed. The stapes was removed and then the vestibule was identified with the spherical recess in the saccular fossa (Figure 3, Panel C). The membrane of the round window was clearly identified. Using a Piezosurgery® instrument (Mectron, Carasco/Genova, Italy), the lateral aspect of the otic capsule was removed at the cochlear level, identifying the basal, middle, and upper turn of the cochlea. Those labyrinthine spaces were almost completely occupied by the mass (Figure 3, Panel D). A dissection of the intracochlear mass was then performed using appropriate angled dissectors (Figure 3, Panel E). Afterwards, using a translabyrinthic approach, the mass was followed to the IAC, which was opened with exposure of the neuros into the IAC (Figure 3, Panel F). The dura had a small defect at that level from which there was a moderate outflow of cerebrospinal fluid while removing the pathology. The mass had a close anatomical relationship to the facial nerve, and it was gently dissected paying careful attention not to damage the nerve. After that, an inspection was made of the fundus of the IAC, to confirm complete removal of the mass (Figure 3, Panel G). Closure of the IAC was performed with abdominal fat, without obliterating the middle ear (Figure 3, Panel D). Cartilage and the perichondrium of the tragus were then positioned to isolate the cochlear cavity from the middle ear spaces. Repositioning of the tympanic membrane and external canal skin was carried out, reinforcing the graft by positioning a tragal cartilage underlay.

In November 2011, a 40-year-old man presented to the ENT emergency room with vertigo, tinnitus, and hearing loss in his left ear. During the clinical history, he referred three emergency evaluations for recurrent dizziness during the last year. Clinically, at the last emergency admission, a second-degree right nystagmus was evident, and he complained of vertigo and tinnitus in the left ear. Clinical manifestations were similar to earlier episodes. Due to the marked neurovegetative symptoms, he was admitted to the ENT Department inpatient clinic for further evaluation. During his hospital stay, an audiometric exam was performed; results were normal for the right ear, whereas for the left ear, there was an almost total deafness with only residual hearing of higher frequencies. The vestibular examination (caloric testing) showed an absence of left vestibular reflexes, and a normal vestibular function contralaterally. The brain CT scan did not show any anomaly (Figure 1, Panel A). At the brain 1 T MRI with contrast medium infusion (gadolinium), an isointense mass at the left cochlear membranous labyrinth was seen in T2-weighted images, sparing the apical turn of the cochlea with a portion invading the IAC; the lesion uptook gadolinium (Figure 2, Panel B). On T2-weighted images, the lesion appeared iso/hypointense to the brain (Figure 2, Panel C, D). These findings were compatible with CS with intracranial extension.

Clinical course The patient was kept in bed for 3 days after surgery. Immediate post-operative facial function did not show any deficit, but a grade III score (House-Brackmann grading system) was present during the second post-operative day. Postoperative pain was well controlled using intravenous paracetamol. Antibiotic therapy (1 g of cefazolin i.v. twice a day) was administered for 48 h after surgery. During the first postoperative day, the patient complained of dizziness, and a second-degree nystagmus appeared right-beating. The vertiginous symptoms gradually improved until complete disappearance on the fifth postoperative day. Paralysis of the facial nerve was treated with i.v. corticosteroid therapy for 8 days (10 mg of methylprednisolone twice a day for 4 days, then once a day for a further 4 days), and during hospitalization, facial nerve paresis improved to a grade II at discharge. The patient was discharged on the 9th post-operative day, after an overall normal postoperative course. The CT scan at 3-month follow-up showed a normal outcome of the endoscopic translabyrinthic surgery on the left side (Figure 4, Panel A, B). Post-operative MRI, also after 3 months, did not show pathological enhancement at the site of the surgery, confirming the complete removal of the pathology (Figure 4, Panel C, D). The facial nerve recovered completely and regained normal function (Figure 5, Panel A, B). The tympanic sinus, visualized by endoscopy at the 3-month follow-up, showed a regular outcome for drum reconstruction, without signs of perforation or CSF leakage.

REFERENCES