Instrument Set for Endoscopic Middle Ear Surgery
Endoscopic Middle Ear Surgery

There has been an increasing trend worldwide towards the use of the endoscope in middle ear surgery thanks to new advancements in instruments and enhanced visualization technologies. All ENT specialists who use the endoscope for middle ear surgery realize how the predominant use of the microscope up to now and its limitations have influenced clinical perception, e.g. when removing a cholesteatoma.

Enhanced visualization technologies in combination with the outstanding optical properties of the endoscope as well as special instruments offer new perspectives and possibilities in middle ear surgery. These developments have led to a change of thinking in sinus surgery and, consequently, to new insights and findings in endoscopic middle ear surgery.

The patient stands to benefit most from endoscopic middle ear surgery. One main advantage is the faster recovery of the patient due to a minimally invasive procedure. Furthermore, it is confirmed that a reduced risk of recurrence occurs if the endoscope is used in cholesteatoma surgery. Moreover, using an endoscope considerably reduces in-situ tumor residue thanks to the enhanced view of the entire surgical site.

The benefits of endoscopic middle ear surgery are based on the key features of the transcanal endoscopic approach:

- Access to previously inaccessible anatomical regions of the middle ear
- Bypassing the postauricular approach which is associated with surgical complications within the tympanic cavity and its hard-to-reach extensions
- Complete examination of the middle ear with a better control over pathology
- Minimally invasive approach
- Enables meaningful photo and video documentation
The key aspect of endoscopic middle ear surgery is the rediscovery of the ear canal as the most logical, direct and natural approach to the middle ear. This provides a new insight into the pathologies found there and changes the surgical treatment paradigm. The wide view provided by the endoscope allows a minimally invasive approach through the ear canal to the tympanic cavity and an all-encompassing view of the structures to be targeted in middle ear surgery. It facilitates the complete extirpation of diseased tissue structures without the need for a postauricular approach. The endoscope can also be used in a variety of other middle ear pathologies.

**Advantages of the endoscope compared to the microscope:**

![Diagram 1: Limited microscopic field of view vs. Wide endoscopic field of view](image1)

Fig. 1: The view through the microscope during transcanal surgery is firmly defined and limited by the narrowest segment of the ear canal. In contrast, the endoscope bypasses this narrow segment and provides a very wide view that allows the surgeon to “look around corners”, even if a 0° telescope is used.

![Diagram 2: Limited transcanal microscopic access vs. Wide postauricular access](image2)

Fig. 2: The limited view provided by the microscope during transcanal procedures has forced surgeons to perform postauricular mastoidectomy during surgery. Here a port parallel to the epitympanum is created after a considerable amount of healthy bone has been removed.
The main drivers in the development of endoscopic ear surgery are the considerably improved image technologies. The benefits of these image technologies such as, for example, KARL STORZ IMAGE1 high-definition resolution and the new 4U (4K) platform combined with the physical and optical advantages of the endoscope create new possibilities of visualization. Higher resolution and contrast allows the surgeon to better identify anatomical structures and to recognize pathological processes in a quality never seen before.
Instrumentation

The following instrument set has been specially designed in order to fulfill the requirements of endoscopic ear surgery. The modified instruments allow a better control over the pathology and facilitate access to previously unreachable or difficult to reach anatomical recesses like the sinus tympani, the facial recess and the anterior epitympanic recess.

227201  **Ear Hook**, curved to right, working length 5.5 cm, total length 16 cm

227202  **Ear Hook**, curved to left, working length 5.5 cm, total length 16 cm

227203  **Ear Hook**, curved backwards, working length 5.5 cm, total length 16 cm

227206  **Ear Dissector**, curved to right, working length 5.5 cm, total length 16 cm
227207  **Ear Dissector,** curved to left, working length 5.5 cm, total length 16 cm

227208  **Ear Dissector,** curved backwards, working length 5.5 cm, total length 16 cm

227211  **Curette,** spoon-shaped, diameter 1 mm, length 16 cm

224003  **HOUSE Double Curette,** medium, spoon sizes 1 x 1.8 mm and 2 x 2.8 mm, length 15 cm

**NEW** 224004  **HOUSE Double Curette,** medium, spoon sizes 1 x 1.6 mm and 2 x 3.5 mm, length 18 cm

**NEW** 227230  **Round Knife,** diameter 3 mm, with suction, easy to handle due to rotating tube olive, length 19 cm
The double-ended, strongly curved dissectors are very helpful in removing tissue out of very deep and difficult to reach areas in the middle ear.

226211  THOMASSIN Dissector, double-ended, distal tips with single curve to right or to left, length 18 cm

226212  THOMASSIN Dissector, double-ended, distal tips with double curve to right or to left, length 18 cm

226213  THOMASSIN Dissector, double-ended, distal tips angled 90° to right or left, length 18 cm

227213  Curette, double-ended, spoon-shaped tips diameter 1 mm and 1.5 mm, end position angled 90° to sheath, length 17 cm
The main difference of this new range of micro cupped forceps is the working length: When working transcanally, the additional 2 centimeters in length provide a more comfortable manipulation of the instruments.

227251 Ear Forceps, 45° curved right, extra delicate, oval cupped jaws, 0.6 mm, working length 10 cm

227252 Ear Forceps, 45° curved left, extra delicate, oval cupped jaws, 0.6 mm, working length 10 cm

227253 Ear Forceps, 45° curved upwards, extra delicate, oval cupped jaws, 0.6 mm, working length 10 cm

227255 Ear Forceps, curved downward and backward, extra delicate, oval cupped jaws, 0.9 mm, working length 10 cm
The New Conical Suction Tubes from KARL STORZ

- **204359 C** Suction Tube, curved 3 mm, Luer-Lock, outer diameter 1 mm, length 8 cm, conical
- **204361 C** Suction Tube, curved 6 mm, Luer-Lock, outer diameter 1 mm, length 8 cm, conical
- **204362 C** Suction Tube, curved 6 mm, Luer-Lock, outer diameter 1.2 mm, length 8 cm, conical
- **204365 C** Suction Tube, curved 8 mm, Luer-Lock, outer diameter 1.2 mm, length 8 cm, conical
- **204366 C** Suction Tube, curved 8 mm, Luer-Lock, outer diameter 1.6 mm, length 8 cm, conical
- **204367 C** Suction Tube, curved 6 mm, Luer-Lock, outer diameter 1.6 mm, length 8 cm, conical
As a supplement to the instrument set, the following instruments can be used for endoscopic middle ear surgery:

- **FISCH Suction Handle**, with cut-off hole, LUER cone, length 5.5 cm, for use with Suction Tubes 204005 – 204025, 204305 – 204330

- **LUER Cone Connector**, male, rotating

- **BELLUCCI Scissors**, delicate, curved to left, working length 8 cm

- **Same**, curved to right
221100  HARTMANN Ear Forceps,
extra delicate, serrated,
1 x 4.5 mm, working length 8 cm

224303  WULLSTEIN Needle,
slight curve, length 16.5 cm

226810  Round Knife 45°, diameter 1 mm,
length 16 cm

226815  Same, diameter 1.5 mm

226820  Same, diameter 2 mm

226823  Same, diameter 2.3 mm

226825  Same, diameter 2.5 mm

226830  Same, diameter 3 mm

226835  Same, diameter 3.5 mm
Endoscopic ear surgery necessitates several different angled endoscopes in order to visualize the entire operating field. The $0^\circ$ and $45^\circ$ telescopes are used in particular. KARL STORZ specially developed the following endoscopes to this end. As they are only 3 mm in diameter and have a length of 14 cm they are ideal for this purpose.

- **HOPKINS® Forward-Oblique Telescope 45°**, enlarged view, diameter 3 mm, length 14 cm, **autoclavable**, fiber optic light transmission incorporated, color code: black

- **HOPKINS® Straight Forward Telescope 0°**, enlarged view, diameter 3 mm, length 14 cm, **autoclavable**, fiber optic light transmission incorporated, color code: green

- **HOPKINS® Forward-Oblique Telescope 30°**, enlarged view, diameter 3 mm, length 14 cm, **autoclavable**, fiber optic light transmission incorporated, color code: red

- **HOPKINS® Lateral Telescope 70°**, enlarged view, diameter 3 mm, length 14 cm, **autoclavable**, fiber optic light transmission incorporated, color code: yellow
Telescopes from the 7229 series that are 2.7 mm in diameter and with a length of 18 cm are also ideally suited for use in middle ear surgery.

- **7229 FA** HOPKINS® Forward-Oblique Telescope 45°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: black

- **7229 BA** HOPKINS® Forward-Oblique Telescope 30°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: red

- **7229 CA** HOPKINS® Lateral Telescope 70°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: yellow
It is recommended to check the suitability of the product for the intended procedure prior to use.