

Sinonasal Inverted Papilloma

Inverted papilloma is an uncommon benign sinonasal tumour that can potentially spread to important neighbouring structures or undergo malignant transformation. Since the aetiology and risk factors for this disease are unknown, the primary treatment is still total excision. Our team has performed research focusing on risk factors, the relationship of the disease with human papillomavirus, radiological diagnosis, review of treatment results, design of a staging system, and selection of surgical approaches to achieve total excision with minimal trauma to neighbouring structures.

Frontal inverted papilloma, which accounts for less than 10% of sinonasal inverted papilloma, is probably the most challenging tumour to manage because of its complicated and highly variable anatomy and close relationship with the eyes and intracranial structures. In an ongoing study, we are designing a staging system for frontal inverted papilloma to facilitate a comparison of treatment results and selection of surgical approaches.

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Olfactory Dysfunction

Smell loss is a common ENT problem without an effective treatment. Major aetiologies include sinonasal diseases as well as post-infectious, post-traumatic and iatrogenic causes. Our team has collaborated with the Division of Neurosurgery of the Department of Surgery in a study on smell loss following transphenoidal pituitary surgery. We are also carrying out a project to study the effect of olfactory training in anosmic and hyposmia patients who did not have any significant sinonasal diseases.

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Head and Neck Squamous Cell Carcinoma

Our team is interested in developing better strategies for the diagnosis, surveillance and management of head and neck squamous cell carcinoma (HNSCC). To that end, we have established a tissue bank of patient tumours and normal paired tissues with serial liquid biopsies and are now investigating novel biomarkers for the diagnosis and surveillance of the disease. We are also involved in the investigation of the role of the microbiome in HNSCC and its potential use as a tool for the diagnosis, surveillance, prognosis and treatment of HNSCC.

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Robotics in Otorhinolaryngology, Head and Neck Surgery

In collaboration with the mechanical engineering departments at CUHK and HKU, we are working on the development of robotics to facilitate surgery in the confined spaces of the head and neck region. We will achieve this through the development of new robotic arms, augmented reality and the integration of different patient-based investigations to facilitate more precise and minimally invasive surgery. As a team, we are also involved in safety and feasibility trials of surgical robots for clinical applications.

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Test Development and Validation

Our team was among the first researchers in the world to successfully apply a complex mathematical model (the Rasch model) for the validation of assessment tools used in communication disorders. Since then, we have developed validated tests such as the Hong Kong Cantonese Receptive Vocabulary Test (CRVT), the Cantonese Basic Speech Perception Test (CBSPT), the Cantonese Tone Identification Test (CANTIT), the Cantonese Perceptual Evaluation of Voice (CanPEV) and the Cantonese Spoken Word Recognition Test (CanSWORT). These tests are widely used in the healthcare industry as objective measurement tools.

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Communication and Swallowing Disorders

Our team specialises in research areas related to communication and swallowing disorders. Highlights of our research include the following:

- Treatment efficacy of various intervention programmes, including swallowing therapy for NPC patients, voice therapy for patients with organic voice disorder, and social thinking training for individuals with high functioning autism
- Application of Fiberoptic Endoscopic Examination of Swallowing (FEES) in the management of dysphagia
- Cognitive intervention for dementia patients and school-age children
- Application of Transcranial Magnetic Stimulation as a treatment option for various communication disorders, including hearing impairment
- Cantonese tone perception and production
- Oral language development of children with hearing impairment

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Otorhinolaryngology, Head and Neck Surgery

The Department of Otorhinolaryngology, Head and Neck Surgery is concerned with the management and research of a wide spectrum of disorders and diseases of the ear, nose, throat, and head and neck. Certain aspects of audiology and communication sciences and disorders are also covered. Additionally, the Department plays a key role as part of a multi-disciplinary team in researching all aspects of nasopharyngeal carcinoma at a molecular, cellular and clinical level, including the diagnosis, treatment and outcomes of patients who develop this head and neck cancer, the commonest form of cancer in Hong Kong and southern China.

New research directions for the Department include the application of research in the hearing aid industry and research related to the epidemiology of health and communication disorders in the Chinese population. The Department also plans to explore further opportunities for international collaboration and inter-institutional research exchanges.

DEPARTMENT OF OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

“ The Department has achieved international status in research on nasopharyngeal carcinoma, hearing and cochlear implant and innovative approaches in Ear, Nose and Throat (ENT) Surgery. Future research emphasis will be on applied clinical research with a multidisciplinary approach.”

Michael Chi Fai TONG
Chairman



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Otology and Neurotology

Otology deals with the diagnosis and management of diseases of the outer and middle ear, while neurotology involves the diagnosis and management of diseases that affect the inner ear and its nerve connections to the brain. The ear is vital for hearing and therefore critical in the development of language and speech in children and for aural communication in an oral world. As patients with hearing loss often suffer from a sense of detachment, restoration of hearing through precise and skilful microscopic and endoscopic surgery of the middle or inner ear benefits not only the patient but also the wider community.

a) Endoscopic Ear Surgery Programme

Endoscopic ear surgery is a natural orifice, minimally invasive surgical procedure that is gaining in popularity worldwide. It has been adopted as an option in the surgical management of cholesteatoma and middle ear operations, including tympanoplasty, ossiculoplasty and stapedotomy. The beauty of endoscopic ear surgery is that it provides a clear picture of the procedure through a high-resolution endoscope and display system. Other benefits include the preservation of normal anatomy and minimal wound-related complications. We pioneered the endoscopic transcanal approach to the lateral skull base region through the middle ear route and, in 2016, conducted the first endoscopic ear surgery workshop in Hong Kong. The workshop is now offered on an annual basis, attracting specialists from all over the world to CUHK.

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b) Bone Anchoring Hearing Aid Health Programme

Hearing impairment and ear infection after radiotherapy treatment is extremely common among patients with nasopharyngeal cancer (NPC) — one of the top ten cancers in Hong Kong — as the external and middle ear are situated within the irradiated region. But fitting traditional air conduction hearing aids in the ear canal can make the ear infection worse. Our Department is the first in the world to apply the Bone Anchoring Hearing Aid (BAHA) on post-irradiated NPC patients, which has proven to be effective in lowering the ear infection rate as well as providing sound amplification comfort. We now also consider BAHA to be one of the key modalities in treating patients with Single Sided Deafness and Conductive Deafness associated with microtia and ossicular chain disease. Comprising dedicated medical, nursing and audiology professionals, our team is fully adept at streamlining the treatment process and managing complications.

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c) Implantable Hearing Aids Programme

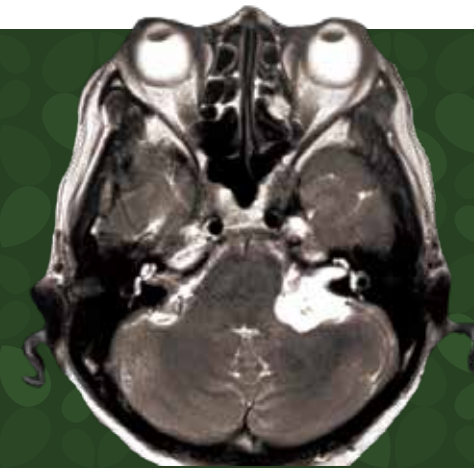
In 2008, our Department announced the first successful operation in Asia for a Totally Implantable Hearing Aid. Then, a year later, we successfully performed the first Vibrant Soundbridge surgery in the region and, in 2012, reached another milestone by successfully implanting Asia's first semi-implantable Bone Conduction Implantable Hearing Aid — the Bonebridge. We are also the only group of specialists in Hong Kong to provide a full range of hearing aid services, including implantable hearing aid surgery and rehabilitation, along with clinical research.

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d) Smart Ear Programme for the Microtia Patients

Microtia is a congenital disease of external ear underdevelopment, commonly associated with hearing loss. Our Smart Ear Programme provides a unique through-train healthcare service for ear reconstruction and hearing rehabilitation. It is offered by our growing team of sub-specialty experts that includes ENT surgeons, speech therapists, audiologists, dental surgeons, nurses, social workers, psychologists, prosthetists and orthotists.

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f) Cochlear Implantation (CI) and Auditory Brainstem Implantation (ABI)

Cochlear Implantation (CI) restores hearing for individuals with congenital deafness, presbycusis and post-irradiation sensorineural deafness. It is one of the finest examples of bionic technology in clinical practice. Auditory Brainstem Implantation (ABI) was developed for the treatment of neural deafness and for individuals with severe inner ear or cochlear nerve malformation. In 1999, we performed Asia's first ABI surgery for adult patients with Neurofibromatosis Type II (NF II). In 2009, we started our paediatric ABI programme with encouraging long-term results.

The CUHK Cochlear Implantation Programme began in 1994. Our current research interests include tonal language development in children with prelingual deafness, minimally-invasive approaches for CI, and auditory rehabilitation of patients with single-sided deafness and tinnitus. With our multidisciplinary team of dedicated audiologists, speech therapists and implant surgeons, we are committed to serving the community and pursuing academic excellence.

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e) Skull Base Surgery Programme

Lateral skull base surgery is one of the most challenging procedures due to the complexity of the anatomy involved and its proximity to critical structures. It is performed for common pathologies, including cancer of the ear, extensive petrous cholesteatoma, tympanojugal paraganglioma, vestibular schwannoma, facial nerve tumours and lower cranial nerve tumours. Our team, which collaborates closely with neurosurgeons, pioneered the transcanal combined microscopic endoscopic approach to the lateral skull base in Hong Kong. This method facilitates the surgical approach to the middle cranial fossa, petrous apex and the internal acoustic meatus, which offers the benefits of minimally invasive surgery with preservation of functions for our patients.

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Auditory Rehabilitation

Elderly persons present greater auditory processing deficits when compared to younger adults who have similar levels of hearing loss. Our team is interested in developing an app-based hearing assessment and auditory training system, which includes phoneme and word identification, temporal discrimination, degraded-speech perception, and speech perception under various background noise settings. The system aims to provide an interactive, attractive, and incentive-based approach to evaluate auditory processing training on decelerating the progression of cognitive decline and improving listening performance among hearing impaired elderly.

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