

出國報告（出國類別：考察）

# 2024 年美國匹茲堡醫學中心顱底手術觀摩 心得報告

服務機關：高雄榮民總醫院/外科部神經外科

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派赴國家：美國匹茲堡

出國期間：2024/07/01~2024/08/30

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## 摘要

美國匹茲堡醫學大學(University of Pittsburgh Medical Center, UPMC)的顱底中心，是北美成立的第一個顱底中心，不論是在傳統開顱、微創開顱或是經鼻內視鏡手術方面，在全球皆處於領先的地位。自 1997 年以來，單是經鼻內視鏡手術便已超過 4000 例，是全世界治療最多腦下垂體腫瘤及顱底病灶的中心之一，亦有許多來自各地的醫生，慕名前來學習。UPMC 顱底中心結合了神經外科、耳鼻喉科、眼科、基礎神經醫學等團隊，為病人提供完善的治療方針，在觀摩期間，除了學習各種先進、複雜的顱底手術方式之外，也了解團隊間如何相互合作，才能讓病人得到最好的照護。

**關鍵字：**經鼻內視鏡手術、腦下垂體腫瘤、顱底手術

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## 一、目的

- (1) 觀摩經鼻內視鏡手術、顱底手術，學習手術技巧
- (2) 學習如何為病人制定治療決策
- (3) 在跨領域會議中吸取不同專家的意見

## 二、過程

初到匹茲堡，因為是第一次到美國，語言不通又人生地不熟的，不過好在這邊的人都很親切和善，治安也不像大城市混亂，適應上沒遇到什麼太大的困難，而且可能醫學中心和學校在附近，外地人也多，不太有種族區別對待的問題。匹茲堡醫學中心其實已經建立成一個 health care system，在賓州各區皆有據點，在各區亦有眾多的衛星醫院組成，所有醫院總數加起來超過 40 多間。我所在的醫院是屬賓州西南方、位在 Oakland 的 Presbyterian，也是顱底手術大宗的所在地，而單單一個院區就很大，第一天報到就迷路了半個小時。

我跟的老師有兩位，分別是神經外科的 Drs. Gardner 和 Zenonos。兩位老師除了每周一天的門診日外，幾乎每天都有手術，雖然我主要重點放在經鼻內視鏡的手術，但其他顱底腫瘤、動脈瘤、動靜脈畸形等的手術也不少，有幸都能觀摩到。兩位老師的手術室主要有三間，每天大約是兩三台顱底手術，其他有一些零星的小手術或會診手術。跟我們不太一樣，他們大多經鼻內視鏡手術術後直接麻醉催醒，不會到加護病房，當然中間催醒、恢復會延遲下台接刀時間，不過他們手術時間快、也比較沒有房間不足、人力不夠的問題，另外民情上也不太相同，所以一般病人住院僅 3~5 天，即便鼻腔還有 packing 或賀爾蒙方面的問題，一樣可以吃藥、先出院再回門診追蹤。

經鼻內視鏡手術，顧名思義是以內視鏡和專門器械，經由鼻子和鼻竇直接到

達並處理顱底和脊椎頂部的腫瘤和病變，早期主要是針對腦下垂體病灶發展的微創手術，現在不僅是治療腦下垂體腫瘤的主流方式，近年來因為技術、器械的不斷進步，對於許多顱底病灶，包括 olfactory groove meningioma、clivus chordoma、甚至基底動脈瘤等，都可以用此手術方式來治療。

在 UPMC 的經鼻內視鏡手術由神經外科會和耳鼻喉科的醫生合作，ENT 主要是 Drs. Snyderman、Eric Wang 和 Choby 三位醫師，有時因病灶位置會會同眼科 Dr. Stefko 或脊椎團隊的醫師一同手術。這類手術的病人在術前都經由各個醫師詳細評估過，所以手術時需要磨開的範圍、需要監測哪幾對神經、測 SSEP、BAEP 或 EMG、那些需要做 nasal septal flap、皮瓣從哪邊取、需不需要另外取脂肪或 fascia lata 都很明確，甚至在他們手術開時前的 time-out，都會互相確認一遍。

手術房內皆有一個壁掛超大螢幕，其他除了手術醫師兩個活動螢幕，神經監測、麻醉側和流動側會至少各有一個螢幕，讓各個團隊知道手術進度，另外顯微鏡和內視鏡都連接實況錄影，並且連接網路和特殊軟體，可以讓主治醫師放刀給住院醫師時，隨處監看手術情況、並可以即時給予糾正。手術器械多半是拋棄式，因為顱底內視鏡手術非常常規，所以常用的藥物、顯影劑會有專用的 package，針對特殊手術，專用器械也都一應俱全。

期間剛好也遇到他們一季舉辦一次的顱底內視鏡解剖課程，這次是高階版的課程，有來自世界各國對於顱底內視鏡有興趣的同好參加。課程中除了安排的教學、大體老師實作、現場示範手術之外，大家也會交流病人照護上遇到的問題和經驗分享。

除了觀摩手術之外，每個星期二下午有 skull base conference，除了神經外科，還有影像科、耳鼻喉科、放射腫瘤科、跨院區的小兒神經科等一同參與，大家會提出一些特別的案例，一起討論治療上遇到的問題和解決的方針。而星期三有全體神經外科的晨會，除了本院區的人員，其他院區也會上線共同討論。

### 三、心得及建議

生平第一次出國進修，非常感謝醫院長官們與合作夥伴們的鼎力支持才能成行，藉由這次機會，吸收不少新知和內視鏡手術的技巧。顱底內視鏡單人和雙人操作上有所不同，雙人操作當然比較彈性靈活，但需要培養默契，也需要時間能相互配合，單人操作就很考驗技術，並且需要其他器械的輔助，這次課程活動有和來自大陸的同好交流，他們因為也是環境條件上不太容易能有合作的夥伴，所以也發展出了獨特手術方式，但就需要時間磨練，而且對於某些手術情境，仍有所限制。除了學習到一些病人照護上的新知、手術的技巧，此次觀摩令我印象最深刻的，是讓我感受到真正的 team work。每個工作包括導航、神經監測都有專門負責的人員，顧好自己的部分之外，有時也會互相提醒，像提醒手術醫師什麼時候該先測一下基準數值、提醒麻醉現在有比較多的出血等等。當然開刀過程中不免有閒聊、氣氛放鬆的時候，但那些都是在做好自己本分工作的前提之下，而且有餘力的時候也會留意其他人的進度，不會因為那是別人的工作而不予理會，所以每一台刀進行下來過程是非常流暢、順利的，這是非常值得學習的部分。而目前院內團隊合作的模式並未成熟，神經監測人員尚須訓練，同時在護理人員的人才留用與新人培訓上，建議院方需要多花些心力。藉由出國觀摩的機會，可以拓展視野，也希望院方能延續現有良好的政策，鼓勵醫師多出國進修、精益求精。

## 四、附錄



### 醫院外觀

因規定院內不可以做任何拍照和錄影，只好照醫院外觀，期間剛好醫院旁邊正在擴建施工中

### 每日行程&識別證

#### CENTER FOR CRANIAL BASE SURGERY/DEPARTMENT OF NEUROLOGICAL SURGERY

##### Weekly CLINICAL Schedule

Monday	Operating Room All Day w/Dr. Gardner; or Outpatient Clinic All Day w/Dr. Zenonos
Tuesday	Operating Room All Day w/Dr. Zenonos; or Outpatient Clinic All Day w/Dr. Gardner <b>4:00 PM: Cerebrovascular Conference (Neurosurgery Main Conference Room)</b> <b>5:00 PM: Skull Base Film Conference (via Teams; link will be sent to you)</b>
Wednesday	<b>7:00 AM: Patient Care/Interesting Case Conference (Neurosurgery Main Conference Room)</b> <b>8:15 AM: Resident/Faculty Educational Series Lecture (Neurosurgery Main Conference Room) OPTIONAL</b> 8:15 AM: Operating Room w/Drs. Gardner and Zenonos
Thursday	Operating Room All Day w/Drs. Gardner and Zenonos
Friday	Operating Room All Day w/Drs. Gardner and Zenonos



# Complex Endoscopic Endonasal Surgery of the Skull Base 課程

<b>(OPTIONAL) FRIDAY, AUGUST 2, 2024 (OPTIONAL)</b>	
Location	Eye & Ear Institute/Biomedical Science Tower: 1 <sup>st</sup> Floor, Room S120 203 Lothrop Street
8:00 AM	REGISTRATION & BREAKFAST
8:15 AM	Case Presentations & Live, Interactive Broadcast of Endoscopic Endonasal Skull Base Surgery
12:00 PM	LUNCH
3:30 PM	Technical Pearls for Advanced Endoscopic Skull Base Surgery for ENTs for Neurosurgeons
	Carl Snyderman George Zenonos
4:00 PM	ADJOURNMENT
5:00 PM - 7:00 PM	WELCOME RECEPTION (REGISTRANTS ONLY)
Location	Courtyard by Marriott: Bridges Patio (100 Lytton Avenue)

<b>SUNDAY, AUGUST 4, 2024</b>	
Location	Eye & Ear Institute/Biomedical Science Tower: 1 <sup>st</sup> Floor, Room S120 203 Lothrop Street
7:15 AM	BREAKFAST
<b>CLIVUS AND PETROUS APEX</b>	
7:30 AM	3D Anatomy
7:50 AM	Anatomy and Technique: Transpterygoid Approach
8:20 AM	Anatomy and Technique: Contralateral Transmaxillary Approach
8:35 AM	Case Discussion: Chondroid Tumors
9:05 AM	Case Discussion: Nasopharyngeal Cancer, Infratemporal Fossa Tumors
9:35 AM	Transfer from Lecture Room to Anatomy Lab
9:45 AM	Prosection: Posterior Fossa, Infratemporal Fossa, Transpterygoid, Contralateral Transmaxillary Approach Reconstruction: Lateral Wall Flap
10:30 AM	Anatomical Dissection
12:15 PM	Transfer from Anatomy Lab to Lecture Room

<b>MANAGEMENT AND PREVENTION OF COMPLICATIONS</b>	
12:25 PM	LUNCH Vascularized Reconstruction and CSF Leak Management
1:05 PM	Vascular Injury
1:30 PM	Transfer from Lecture Room to Anatomy Lab (* take personal belongings with you *)
2:00 PM	Anatomical Dissection and ICA Injury Simulation Exercises
5:00 PM	AFTERNOON PROGRAM ADJOURNMENT

<b>EVENING PROGRAM (REGISTRANTS ONLY)</b>	
6:00 PM	Transportation Departs Courtyard by Marriott Hotel for Course Banquet
6:30 PM	COURSE BANQUET
Location	Monterey Bay Fish Grotto Skyline Room 1411 Grandview Avenue Mount Washington <a href="https://www.montereybayfishgrotto.com/">https://www.montereybayfishgrotto.com/</a>
9:30 PM	Transportation Departs Course Banquet for Courtyard by Marriott Hotel

<b>SATURDAY, AUGUST 3, 2024</b>	
Location	Eye & Ear Institute/Biomedical Science Tower: 1 <sup>st</sup> Floor, Room S120 203 Lothrop Street
7:00 AM	REGISTRATION & BREAKFAST
7:15 AM	Welcome, Course Overview & Lab Safety Training
	Eric Wang
<b>SUPRASELLAR AND RETROCHIASM PATHOLOGY</b>	
7:30 AM	3D Anatomy
7:50 AM	Case Discussion: Cranioopharyngioma
8:20 AM	Case Discussion: Suprasellar Meningioma
8:50 AM	Transfer from Lecture Room to Anatomy Lab
9:00 AM	Prosection: Suprasellar Cistern and Retrochiasmatic Space Reconstruction: Nasoseptal Flap
9:30 AM	Anatomical Dissection
11:50 AM	Transfer from Anatomy Lab to Lecture Room
<b>ANTERIOR CRANIAL FOSSA</b>	
12:00 PM	LUNCH 3D Anatomy
12:30 PM	Case Discussion: Sinonasal Malignancy
1:00 PM	Case Discussion: Olfactory Groove Meningioma
1:30 PM	Anatomy and Technique: Supraorbital Approach
2:00 PM	Transfer from Lecture Room to Anatomy Lab (* take personal belongings with you *)
2:10 PM	Prosection: Anterior Cranial Fossa, Interhemispheric Fissure, Olfactory Tracts, Gyrus Rectus, Medial Orbital Gyrus, Supraorbital Approach Reconstruction: Pericranial Flap
3:00 PM	Anatomical Dissection
5:30 PM	ADJOURNMENT / EVENING AT LEISURE (For information about events, shopping areas, or restaurants in or near Oakland, please visit ( <a href="http://www.pittsburghmagazine.com">http://www.pittsburghmagazine.com</a> ) or <a href="http://www.visitpittsburgh.com/">http://www.visitpittsburgh.com/</a> ) or feel free to ask us for recommendations!)

<b>MONDAY, AUGUST 5, 2024</b>	
Location	Eye & Ear Institute/Biomedical Science Tower: 1 <sup>st</sup> Floor, Room S120 203 Lothrop Street
7:45 AM	BREAKFAST
<b>CAVERNOUS SINUS AND MIDDLE CRANIAL FOSSA</b>	
8:00 AM	3D Anatomy
8:20 AM	Anatomy and Technique: Medial Cavernous Sinus Resection, Oculomotor Triangle
8:40 AM	Anatomy and Technique: Lateral Orbitotomy
9:10 AM	Case Discussion: Tumors of Cavernous Sinus
9:40 AM	Transfer from Lecture Room to Anatomy Lab
9:50 AM	Prosection: Cavernous Sinus, Middle Cranial Fossa and Lateral Orbitotomy
10:35 AM	Anatomical Dissection and ICA Injury Simulation Exercises
12:35 PM	Transfer from Anatomy Lab to Lecture Room
12:45 PM	LUNCH Panel Discussion: Postoperative Care Moderator: Garret Choby
1:30 PM	Group Photo
1:40 PM	Transfer from Lecture Room to Anatomy Lab (* take personal belongings with you *)
1:50 PM	Anatomical Dissection
4:00 PM	COURSE ADJOURNMENT

課程團體照





和 Dr. Gardner 在課程晚宴的合照 和 Dr. Snyderman 合照



課程結業證書



參訪結束的證明

UPMC  
LIFE CHANGING MEDICINE  
University of Pittsburgh Physicians  
Center for Cranial Base Surgery

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**Directors**  
Carl H. Snyderman, MD, MBA  
Paul A. Gardner, MD  
Eric W. Wang, MD  
Georgina A. Zeman, MD  
Garret M. Choby, MD

August 30, 2024

To whom it may concern:

This letter certifies the appointment of **Ying Tso Chen, MD** as a **Visiting Clinical Observer** in the **Center for Cranial Base Surgery** within the **Department of Otolaryngology** at the **University of Pittsburgh Medical Center** from **July 1, 2024-August 30, 2024**.

During this time, Dr. Chen observed (that is, no hands-on or direct patient care was permitted at any time) both endoscopic endonasal and open approaches to tumors of the cranial base and pituitary fossa, as well as miscellaneous rhinologic surgical procedures performed by myself and my colleagues, Dr. Eric Wang and Dr. Garret Choby, in the operating theatre. Dr. Chen also observed the evaluation and management of patients in the outpatient office and attended our weekly Skull Base Film Conference as well as our department's weekly Grand Rounds. Dr. Chen also had the opportunity to attend the lectures and dissections of the course, **Complex Endoscopic Endonasal Surgery of the Skull Base**, which we held here on campus from August 3-5, 2024.

It was a pleasure having Dr. Chen with us. She was very diligent with her attendance and always asked very thought-provoking questions. If any further information is needed regarding her time with us, please do not hesitate to contact me.

With kindest regards,

Sincerely,

Carl H. Snyderman, MD, MBA  
Professor  
Departments of Otolaryngology, Neurological Surgery and Bioengineering  
University of Pittsburgh  
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