

Brief summary of leave:

To provide advanced training in Otolaryngology most universities in United States offer seven clinical fellowship programs. The principal goal of these programs is to prepare the academically inclined residency graduate for their faculty appointment. Clinical instructors not only undertake training in their sub-specialty of interest, but also serve as junior faculty members with a major role in resident education.

Fellowship in otolaryngology are Neurotology, Pediatrics, Head & Neck, Laryngology, Sinus/Rhinology, Sleep Medicine & Surgery, Facial Plastics.

Stanford University has a distinguished otolaryngology department. One of the most active divisions is otology-neurotology division. This division consists of a comprehensive clinical team including skull base team, otoneurology and dizziness, cochlear implant, facial nerve, basic research labs in chronic ears and hearing rehabilitation.

List of objectives:

Training in lateral skull base surgery and otology by expert team of Neurotology.

Training in cochlear implant and novel rehabilitation approaches.

Training in dizziness multidisciplinary setting.

Performing clinical research in Neurotology, especially vestibular schwannoma.

Achievements:

During this year I was engaged with neurotology practice in Stanford. Distinguished faculty in neurotology consists of Professors Robert Jackler (Head of department), Nikolas Blevins (Head of otology division and head of American Neurotology Society), Lloyd Minor (Dean of school of medicine), Hamed Sajjadi, Peter Santa Maria, Jennifer Alyono, Kristen Steenerson, John Sheen, George Sharago, Albert Mudry.

There is a very sophisticated dizziness program in Stanford University. I dedicated a short period of my visit to this discipline. I could be able to work with neurologist, otologist, physiotherapist, audiologists expert in vestibulology. This was a great opportunity to enhance my knowledge and insight in management of patients with balance issues. I trained in vestibular testing including VEMP, vHIT, ECOG, VNG, Rotatory chair, Computerized dynamic posturography.

I also participated in cochlear implant program. I observed procedures and new techniques in surgery and management of cochlear implant patients especially hearing preservation techniques and bimodal and hybrid rehabilitations.

There is a hearing camp in Stanford which is held every summer and is designed to improve rehabilitation techniques and knowledge in caregivers and also train the parents. Participating in this setting was very informative regarding the organization and structure of rehabilitation program for cochlear implant patients, especially pediatric population.

Stanford health care, has a sophisticated skull base center. This team consists of otolaryngologists, neurosurgeons, neurologists, neuromonitoring team, Radiotherapy team, simulation team, audiology and rehabilitation team. I spend significant of my training with this team as one of my main objectives was to train in this field. I observed significant number of lateral skull base cases especially vestibular schwannoma and meningiomas. I also did a course on skull base radiosurgery and treatment planning.

In this year I also had the chance to visit otology department in Iowa and USC university. In Iowa I observed extensive skull base cases, especially middle fossa approach. I learnt from extensive cochlear implant research, including intra-op ECOG

during cochlear implantation, inserter device for cochlear implants, hearing preservation in cochlear implantation. In UCSF I trained in cochlear implant programming, especially for music perception in cochlear implant users.

I attended following meetings and congresses during this year:

- American academy of otolaryngology annual meeting. This is the largest event in ENT in north america. Detailed scientific program of the meeting caused a very vast exposure to informative talks and workshops. I was part of presentation of the simulation project of the stanford. We presented the simulation device for temporal bone surgery.
- Otology update meeting. This is a biannual meeting which is very detailed and subspecialized in otology and skull base. Multiple workshops and high quality talks were a great educational chance.
- American Neurotology Society meeting. this is a sub-specialized meeting in neurotology and current challenges in this field. Multiple panels and keynote lectures was a great opportunity to be update about this filed innovations.
- Combined Otolaryngology Spring Meeting (COSM). This is a combined meeting of American societies in otolaryngology, including, American Otological Society (AOS), American Neurotology Society (ANS), American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS), American Rhinologic Society (ARS), American Society of Pediatric Otolaryngology (ASPO), American Broncho-Esophagological Association (ABEA), American Laryngological Association (ALA), American Head and Neck Society (AHNS), The Triological Society (TRIO). This is a great event to participate in different sub-specialty disciplines. I participated mostly in otology and neurotology society sessions and learned from keynotes, scientific presentations and discussion panels.

I did my research in following research projects:

- Propensity analysis of Vestibular Schwannoma Patients. Natural history of vestibular schwannoma is not understood well and this leads to difficulty in decision making in these patients. In this project we did propensity analysis to investigate different factors effective in these patients outcomes.
- Study of Metformin therapy on vestibular schwannoma natural history. Metformin has been suggested as an anti-tumor agent in other studies. In this study we compared tumor growth in patients using Metformin with control group.
- Prevalence of Superior Semicircular-Canal Dehiscence in Patients With Obstructive Sleep Apnea. One of proposed pathophysiologic process for SCD syndrome is increased intracranial pressure which may be aggravated by OSAS. We investigated prevalence of SCD in these patient group and compared with controls.
- Remote intra-operative NRT in cochlear implant surgery. Performing intra-op NRT can be informative regarding electrode placement and success of operation, but is time consuming and costly. In this project we evaluated feasibility and success rate of performing remote NRT in cochlear implant surgery.
- Study of clinical yield of post op Imaging in cochlear implant surgery. One of common practices in CI surgery is checking electrode placement by Radiography. However, there is no accurate study investigating efficacy of this practice. In this project we studied accuracy and influence of post-op Xray in management of these patients.
- study of tympanic membrane healing process in animal chronic otitis media model. Chronic ear infections are one of the most common diseases of the ear especially in the developing parts of the world. In order to better understand the healing process of the tympanic membrane and disease process in chronic suppurative otitis media we studied immunologic cascades in animal models of CSOM.
- Risk Stratification for Postoperative Venous Thromboembolism After Otologic Surgery. Anti-thrombotic therapy is very common in management of surgical patients, especially skull base procedures. However they may cause increased risk of bleeding and complications. In this study we evaluated anti-thrombotic therapy and outcome of patients and provided a model of risk stratification in these patients.

-creating transient eustachian tube occlusion mouse model. Eustachian tube has always been thought to play a major role in chronic middle ear inflammatory diseases. However, there is no proper animal model to study these processes. In this project we invented a mouse model for ET closure and proved it effective in CSOM model.

-A new theory for Paracusis Willisii. Patients with otosclerosis may experience paracusis, which was described by Willis long time ago. However, there is no explanation for this phenomenon. In this project we proposed an explanation based on temporal bone laser vibrometry study.

-review paper on biofilm and chronic ear infections. Biofilms and their role in pathophysiology of chronic middle ear infections are brought to attention recently. In this project we gathered a scientific review of current knowledge regarding biofilms and their role in CSOM and management options.

#### Assessment:

Spending one year in a distinguished center improved my knowledge and skills in every academic aspect. Observing top of the line practice and new technologies gave me better insight for patient management. This is more important in skull base patients. These patients management have multiple complicated aspects which can be improved a lot in our health system.

Being involved in high quality research improved my research abilities and also my insight regarding a prestigious research facility. I am engaged in continuing research with Stanford department and collaborating with such research center will be a great opportunity for our department.

I investigated and involved a lot in education system and different aspects of medical students, residents, and fellowship education. Novel and innovative techniques of education system, evaluation strategies, and feedback will help our department a lot and I did my best to experience and model every aspect of that system.

Participating in scientific events helped me learn more about organization of such events. Implementing these findings will help to improve quality of our meeting and conferences a lot.

Our department by collaboration with advanced centers in the world and implementing innovative education system will try to enhance our health system and patient management and also in training powerful academic specialists for our country and upgrade our specialty. This was the main mission of our center before and it will be for future.