A Leading Provider of Advanced Speech, Language and Hearing Solution

01

Case Reports

Dr. Neena Bhalodiya
Dr. Udit Saxena
Dr. Meenakshi Sukumar

Background

Gujarat Medical Education & Research Society (GMERS) Hospital, Sola, Ahmedabad, a Gujarat University-affiliated and NABH-accredited institution, has been a stronghold of medical education and patient welfare since 1986. The college, reputed for its high patient influx and commitment to innovation, is the first government medical college in the state of Gujarat to offer a Bachelor in Audiology & Speech-Language Pathology (BASLP) in the department of ENT, with facilities including hearing labs, tele-rehabilitation and frontiers in cochlear implants across Gujarat along with other clinical services & research services. Rehabilitation Council of India recognized the state-of-the-art technology and patient-centered care in providing comprehensive services for hearing, balance, speech, language, and swallowing disorders within the department of ENT at GMERS, Sola.

Distinctiveness of the practice

The Audiology and Speech-Language Pathology (ASLP) Department at GMERS has established state-of-the-art facilities including the following facilities:

- A Memory Clinic for cognitive-communication and comprehensive swallowing disorder management were offered. The clinic integrated traditional assessments with modern cognitive tools, such as computerized evaluations and memory recall exercises, to manage communication-related cognitive decline, particularly among older adults.
- Vestibular testing significantly enhances the quality of life for individuals suffering from balance disorders such as dizziness and vertigo.
- Personalized therapy sessions conducted in soundproof rooms allowed focused, patient-specific treatments, while sensory integration therapy assisted children with Autism and Attention Deficit Hyperactivity Disorder (ADHD) in developing essential social and communication skills. Personalized interventions, including articulation therapy, voice modulation, and language therapy, are tailored to individual needs, promoting rapid progress and long-term success.
- Cochlear implant rehabilitation ensured post-implant patients maximize their auditory potential for improved speech comprehension.
- Tele-rehabilitation further expanded the department's reach, providing remote patients with access to high-quality therapy and support including virtual auditory training and speech therapy.
- Sensory integration therapy, facilitated by sensory gyms and specialized equipment, supports children with ASD and ADHD by improving sensory processing, communication skills, and social interactions. Techniques such as deep pressure therapy, balance activities, and auditory integration training further contribute to positive outcomes.

- Additionally, electroglottography and acoustic analysis systems enhanced voice assessments, while modified barium swallow studies conducted by the department provided critical insights into swallowing disorders (dysphagia), ensuring improved patient safety and nutritional management.

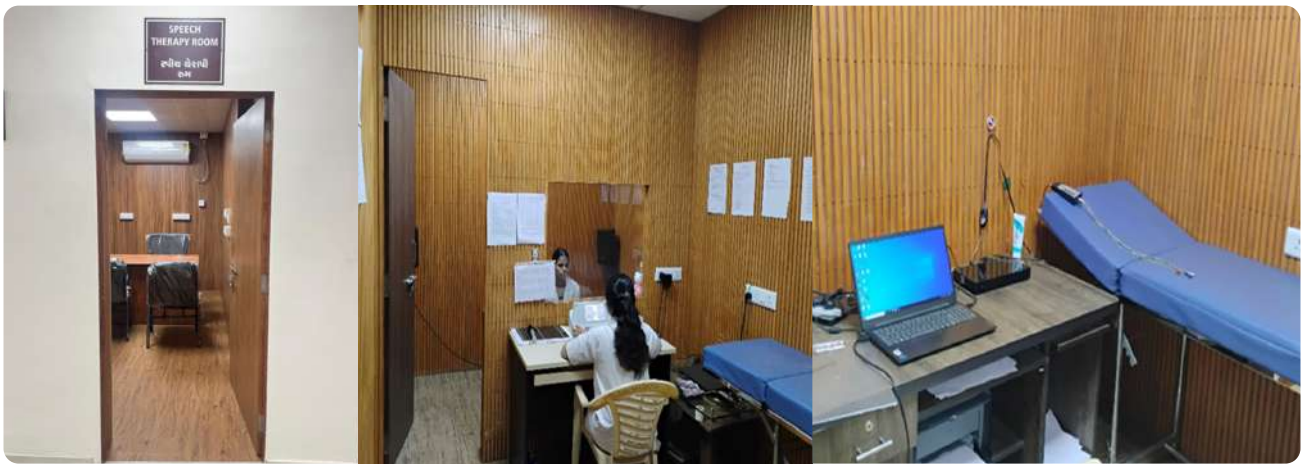

Fig. 2 Electrophysiology and Vestibular Labat ASLP Department, GMERS, Sola

Challenges encountered

A significant challenge faced by the ASLP Department at GMERS was the low awareness and acceptance of speech and hearing disorders among both the public and private healthcare providers. This resulted in underdiagnosis and undertreatment of communication disorders (e.g., speech delays, hearing impairments, cognitive communication challenges); and weak referral mechanisms, with many primary care providers failing to recognize the importance of speech and hearing assessments. To effectively address the low awareness and acceptance of speech and hearing disorders, GMERS, Sola, implemented a multi-pronged approach: (1) targeted outreach activities and (2) developed referral mechanism in close collaborations with key hospital departments, particularly the OPD, gynecology department and Rashtriya Bal Swasthya Karyakram (RBSK) units.

- **Targeted outreach activities:** The outreach initiatives included awareness campaigns, educational workshops, and screening camps conducted in schools, maternity clinics, and community health centers with an aim to educate parents, caregivers, and healthcare professionals on the early signs of speech and hearing impairments, emphasizing the importance of early intervention and breaking societal misconceptions.
- **Referral mechanism:** To improve referrals, speech and audiology services were integrated with the hospital's OPD and gynecology departments. Recognizing the link between many disorders and birth-related factors, newborn hearing screenings and speech evaluations were incorporated into postnatal care. This early intervention ensured prompt identification of congenital hearing loss and speech delays. Furthermore, collaboration with OPD physicians established a streamlined referral system, enabling early identification of various communication disorders during routine consultations and facilitating timely access to specialized care.

Measuring effects

The ASLP Department at GMERS has made remarkable advancements in communication and rehabilitative services, significantly enhancing patient outcomes and professional development.

- Cochlear implant rehabilitation has led to a 70% improvement in auditory comprehension and a 40% increase in speech recognition, fostering greater

patient confidence and independence.

- Precise audiological diagnostics and vestibular rehabilitation programmes have resulted in a 60% reduction in dizziness episodes and a 50% improvement in balance control, as confirmed through dynamic post-urography.
- Sensory integration therapy for children with ASD and ADHD has enhanced sensory processing abilities by 45% and improved social communication skills by 30%, while voice and swallowing therapy has led to a 40% enhancement in voice quality and a 50% reduction in swallowing difficulties.
- The memory clinic has demonstrated a 20% improvement in memory recall and cognitive engagement in social settings.

Beyond clinical improvements, patients gain increased confidence and independence, enabling fuller social, educational, and professional engagement. Enhanced personal interactions strengthen relationships and foster community integration, while outreach programmes equipped families with essential knowledge about communication disorders, encouraging proactive health management. Early identification and management further contributed to cost savings by minimizing the need for complex treatments later. For healthcare professionals, access to state-of-the-art facilities boosts morale, supports professional development, and increases job satisfaction.

Lessons Learned

The department's experience has provided key insights into enhancing patient care through personalized treatment plans, advanced diagnostics, interdisciplinary collaboration, and improved accessibility.

- Tailored approaches, particularly in cochlear implant rehabilitation and speech therapy, have proven crucial for significant improvements in auditory comprehension and speech recognition.
- The use of advanced diagnostic tools enabled precise assessments, leading to more effective treatment strategies.
- Interdisciplinary collaboration, integrating expertise from multiple fields, ensured holistic care for complex cases, while tele-rehabilitation has expanded accessibility, allowing remote patients to receive high-quality treatment.
- The success of the initiative highlighted the role of adequate infrastructure, such as soundproof therapy rooms, tele-rehabilitation, etc., to enhance treatment effectiveness.
- Awareness and education programmes for both professionals and the public play a vital role in fostering understanding and reducing stigma associated with communication disorders.
- Early identification and management significantly improve patient outcomes and reduce the need for extensive interventions later.

Sustainability of Practice

Sustainability is at the core of ASLP's mission to provide high-quality, patient-centered care, integrating effective, accessible, and environmentally responsible services. A commitment to continuous professional development ensures clinicians stay updated with advancements, translating research into improved patient outcomes. Tele-rehabilitation plays a crucial role in expanding accessibility, particularly for rural or mobility-challenged patients, improving engagement and treatment adherence.

Community outreach and education initiatives further promote awareness of communication disorders, equipping individuals with knowledge and resources for proactive health management, ultimately reducing the need for long-term interventions. Sustainability is reinforced through alignment with hospital policies and workflows, ensuring integration with strategic goals and consistent institutional support. Securing continuous funding from government and stakeholders remains a priority, while regular training programmes for professionals, parents, and patients help maintain expertise in managing communication disorders. Ongoing data

collection and research further inform service improvements and uphold the highest standards of care.

Conclusion

Successful implementation of the ASLP Department necessitates strategic considerations. This includes investing in infrastructure (especially soundproof therapy rooms, acquiring advanced equipment and softwares), providing comprehensive training for healthcare professionals, parents, and patients; targeted awareness campaign; continuous data collection & analysis. Furthermore, addressing societal stigma is essential for ensuring the long-term sustainability and effectiveness of these services.

A Leading Provider of Advanced Speech, Language and Hearing Solution

1

Target Population

Patient with hearing, balance, speech, language, and swallowing disorders.

2

Phenomenon of Interest

The first government college in Gujarat with facilities like soundproof therapy rooms, enabling precise audiology diagnostics, computerized cognitive tools, vestibular testing, voice analysis, cochlear implant rehabilitation, and sensory integration.

3

Context

Low awareness about speech and hearing disorders among the public and healthcare providers, results in underdiagnosis and undertreatment of communication disorders. In addition, weak referral mechanisms, with many primary care providers failing to recognize the need.

Conclusion

Successful ASLP implementation requires infrastructure investment, training, awareness, data analysis, and stigma reduction for long-term sustainability.

Key Findings

1

Cochlear Implant Rehabilitation

70% improvement in auditory comprehension and a 40% increase in speech recognition, enhancing patient confidence and independence.

2

Multi-Pronged Approach for Enhanced Access

Implemented targeted outreach activities and streamlined referral mechanisms through close collaboration with key hospital departments to improve patient access and continuity of care.

3

Specialized Rehabilitation Programs

Audiological diagnostics and vestibular therapy reduced dizziness by 60% and improved balance by 50%, while sensory integration therapy enhanced sensory processing (45%) and social communication (30%) in ASD/ADHD children; voice and swallowing therapy improved voice quality (40%) and swallowing (50%); the memory clinic boosted recall and cognitive engagement by 20%.

DEEP-NAZ Forceps: An Innovative Solution for Aphakia

Dr. Deepika Singhal
Dr. Vaishali Prajapati
Dr. Aneri Shah
Dr. Dharati Thakkar

Background

Gujarat Medical Education & Research Society (GMERS) Hospital, Sola, Ahmedabad, has been a prominent healthcare and educational institution since 1986. Affiliated with Gujarat University, it offers a range of specialties and is NABH-accredited. The hospital serves both urban and rural populations, achieving a high OPD turnout and a bed occupancy rate exceeding 75%.

One of the hospital's most notable innovations is the development of the DEEP-NAZ forceps, designed to address the challenges of secondary intraocular lens (IOL) implantation in aphakic patients.

Fig. 1 Design of DEEP-NAZ forceps

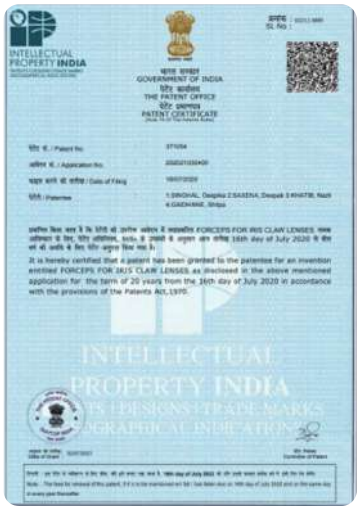

Fig. 2 Patent certificate

Distinctiveness of the practice

The DEEP-NAZ forceps were specifically designed to overcome challenges faced during iris claw lens implantation for secondary IOLs. The unique features of this forceps include angulated arms and spatulated tips, which ensure secure grasping of the lens and facilitate ease of implantation. Unlike conventional forceps, which often result in slippage or difficulties in centration, the DEEP-NAZ forceps streamline the procedure by:

- Providing a stable grip on the lens during insertion.
- Reducing the risk of slippage into the vitreous cavity.
- Ensuring precise centration of the IOL behind the pupil.

This innovative device was conceptualized, prototyped, and refined through a collaborative effort, ultimately receiving Indian and international patents on July 16, 2020. The following techniques were deployed:

Development Process

- A landscape review of iris claw implantation complications and surgical challenges was conducted.
- Collaboration with the Datta Meghe Institute of Higher Education and Research's incubation center facilitated the design process.
- Prototypes were iteratively developed, tested, and refined to address issues like lens slippage and alignment difficulties.

Design Features

- Angulated arms with spatulated tips for secure gripping.
- A supporting plate with horizontal markings to ensure accurate centration.
- Extendable components to facilitate maneuverability through the main port without requiring hand position changes.

Testing and Validation

- Initial trials involved 10 patients undergoing secondary IOL implantation.
- The tool was then adopted by 10 surgeons, who used it in over 20 surgeries each. Feedback highlighted the tool's efficacy and ease of use.

Measuring effects

The DEEP-NAZ forceps have significantly impacted both surgical outcomes and the broader healthcare ecosystem:

- Over 200 surgeries were performed using the DEEP-NAZ forceps, with a documented reduction in complications compared to conventional methods.
- Surgeons reported a 95% success rate in achieving optimal IOL placement without complications.
- Patient recovery times were significantly reduced, with most patients reporting improved vision within two days post-surgery.
- Reduced complications, quicker recovery, and improved visual outcomes have enhanced patient satisfaction and trust in healthcare providers.
- For Surgeons, the forceps simplified the procedure, reduced the likelihood of surgical errors, and ensured better precision, especially in challenging cases.

Challenges encountered

The development of the DEEP-NAZ forceps was driven by the need to overcome fundamental challenges associated with iris claw lens implantation in secondary intraocular lens (IOL) surgery. One of the primary concerns in these procedures are ensuring a secure grip on the lens to prevent displacement during implantation. Conventional forceps often struggle to maintain a firm hold, increasing the risk of lens slippage into the vitreous cavity, misalignment, or difficulty in maneuvering the lens into its optimal position. The DEEP-NAZ forceps, designed with angled arms and spatulated tips, provide a stable and controlled grasp, minimizing these risks and allowing for smooth, precise placement of the lens.

Another critical challenge in secondary IOL implantation is achieving accurate alignment to optimize visual outcomes. Even minor misalignment can lead to compromised vision quality and post-operative complications. To address this, the DEEP-NAZ forceps incorporate a supporting plate with horizontal markings, enabling surgeons to achieve meticulous alignment of the lens behind the pupil. This design significantly enhances placement accuracy and improves long-term visual outcomes for patients.

Furthermore, the high cost and limited accessibility of specialized surgical tools pose a significant barrier to both public and private healthcare sectors, particularly in resource-limited regions. Many advanced ophthalmic instruments are either disposable or require expensive maintenance, making them financially unfeasible for widespread use. The DEEP-NAZ forceps were specifically designed to be cost-effective and reusable, ensuring that they can be utilized multiple times without compromising their functionality. This approach makes the tool accessible to a broader range of healthcare institutions, bridging the gap between affordability and high surgical precision.

Lessons Learned

- In surgical innovation, iterative development was crucial—continuous feedback from surgeons during prototype testing refined the final design to address practical challenges effectively.
- Collaboration with experts and incorporation of user feedback were instrumental in the

success of the DEEP-NAZ forceps, enhancing precision and reducing complication rates.

- Additionally, structured training programmes for surgeons and medical residents have been essential for maximizing the tool's potential and ensuring widespread adoption. These lessons underscore the importance of infrastructure, education, early intervention, collaboration, and continuous improvement in achieving medical excellence and patient-centered care.

Sustainability of Practice

The DEEP-NAZ forceps have been integrated into clinical practice at GMERS Hospital and other healthcare institutions. To ensure long-term sustainability:

- Training is needed to familiarize surgeons with the tool.
- Efforts are underway to include the forceps in government procurement under the National Programme for Control of Blindness, ensuring availability in public hospitals.
- The DEEP-NAZ forceps can be easily adapted to diverse healthcare settings due to their user-friendly design.

Conclusion

The DEEP-NAZ forceps is an innovation that improves not only surgical procedures to improve clinical outcomes but also enhances patient satisfaction and surgeons' competencies. By improving the success rate of secondary IOL implantation, the forceps contribute to the National Program for Control of Blindness and Visual Impairments, reducing the burden of preventable blindness in India.

DEEP-NAZ Forceps: An Innovative Solution for Aphakia

1 Target Population

Aphakic patients undergoing secondary IOL implantation, ophthalmic surgeons, and healthcare institutions.

2 Phenomenon of Interest

Use of DEEP-NAZ forceps to enhance precision, safety, and efficiency in secondary IOL implantation.

3 Context

Clinical adoption at GMERS Hospital and other institutions, supporting the National Programme for Control of Blindness.

Conclusion

The DEEP-NAZ forceps represent a significant advancement in ophthalmic surgery, improving the success rate of secondary IOL implantation while ensuring patient safety and faster recovery.

Key Findings

1 Enhanced Surgical Outcomes

The DEEP-NAZ forceps improved IOL implantation precision, reducing complications and achieving a 95% success rate in optimal lens placement.

2 Faster Recovery & Patient Satisfaction

Over 200 surgeries showed quicker recovery times, with most patients reporting improved vision within two days post-surgery and high satisfaction.

3 Cost-Effective & Scalable Innovation

Designed for reusability and affordability, the forceps bridge accessibility gaps, supporting wider adoption in public hospitals under the National Programme for Control of Blindness.