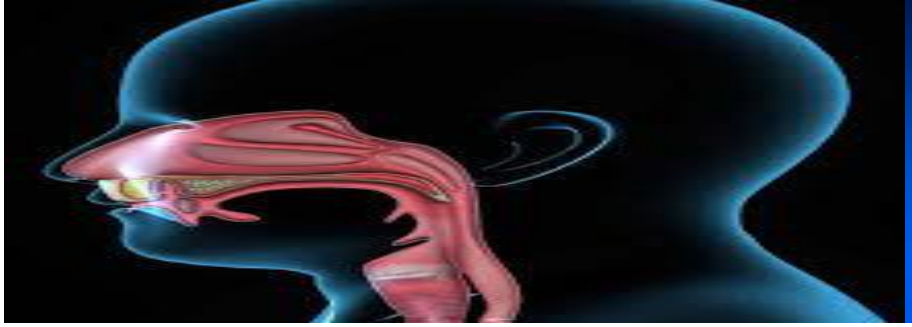
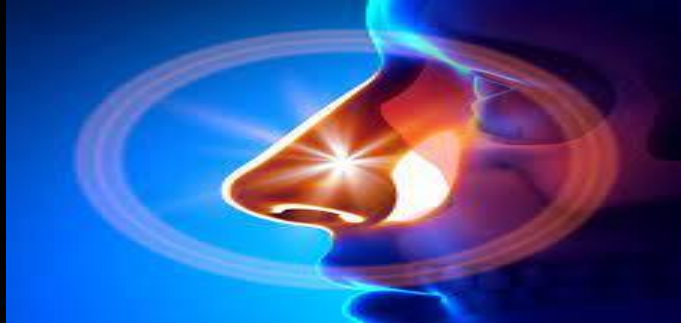

ENT NEWSBUZZ

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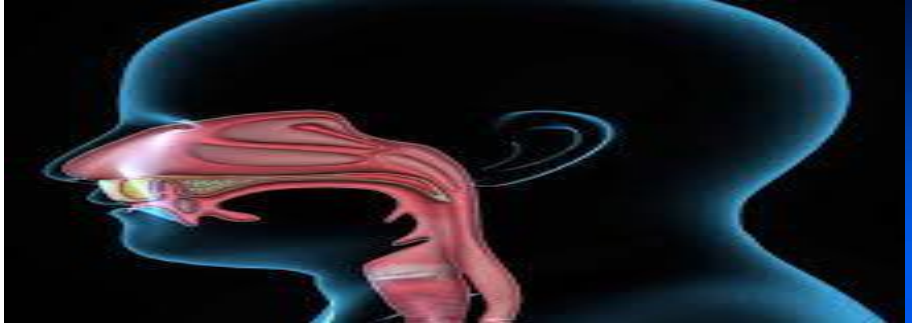
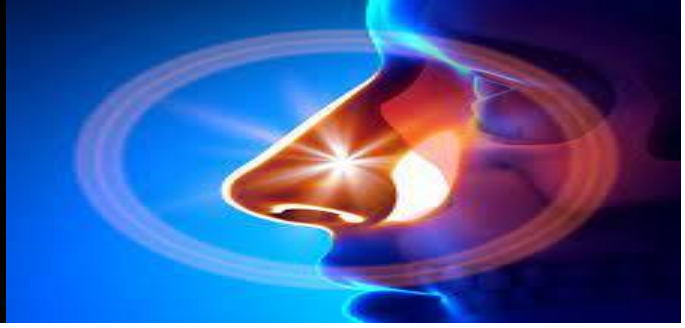

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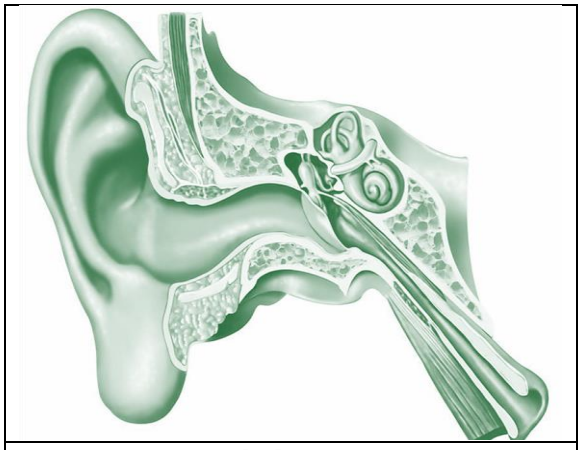
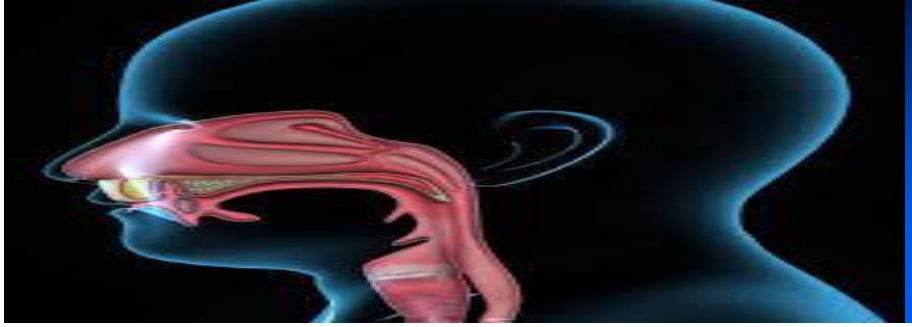
Assessment of the relative efficacy of vestibular function tests in individuals with central and peripheral vestibular impairment

Introduction: Approximately 20% of adults experience dizziness and imbalance, which significantly increases patient suffering and incapacity. In order to diagnose whether damage has been done to the peripheral vestibular system, vestibular testing has been utilized. A comprehensive vestibular test battery evaluated the inner ear's five vestibular end organs, which include the two otolith organs (saccule and utricle) that transduce linear acceleration and the three semicircular canals that transduce angular acceleration. But the entire labyrinth cannot be evaluated by a single vestibular test. Because its function may be assessed using three distinct vestibular tests bithermal caloric irrigation, video head impulse test (vHIT), and rotational testing the horizontal semicircular canal was the most susceptible to study of all the vestibular organs.[1] In contrast to the rotatory chair test, which uses computer control to produce either a step stimulation or a real sinusoidal rotation, the caloric test replicated a sinusoidal stimulus in the ear artificially. Test-retest reliability was good for the rotatory chair test but low for the caloric test. The video head impulse test measured how the eyes reacted to abrupt head impulses that have a high frequency (1–16 Hz) and velocity (above 150°/second). The response was primarily mediated by the vestibulo-ocular reflex and was limited to the first few milliseconds following the start of the short stimulus.[2] The primary drawback of vHIT was that it requires an experienced operator because low head accelerations, high head overshoots, or extended excursion angles of head movement could result in erroneous results. Furthermore, cervico-ocular reflex responses were triggered by head motion on the body and were mild in healthy people but more pronounced in patients with vestibular impairment, vHIT did not isolate vestibular afference as rotational testing does.[1]


Vestibular system

The purpose of this study was to investigate whether: (1) the diagnostic value of combining two or more vestibular tests was increased compared to using a single test; and (2) there was a correlation between aberrant test results and vestibular tests.



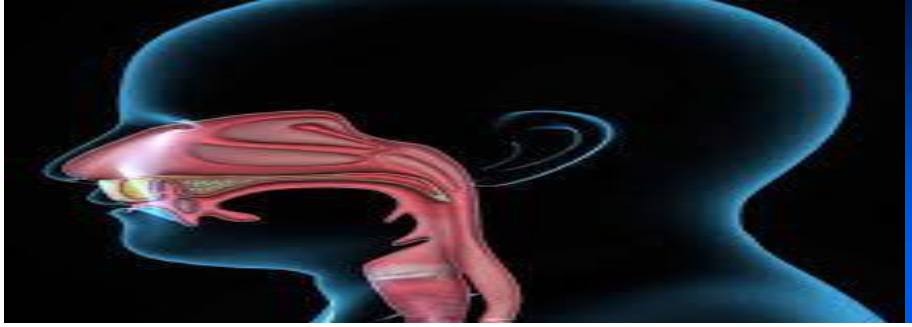
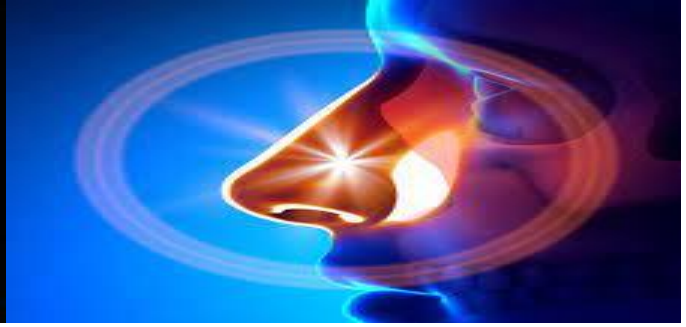

Methods: A total of 150 patients were included in this retrospective analysis. Vestibular testing comprised sinusoidal en-bloc rotations (i.e., rotary chair), impulsive head-on-body (vHIT) rotations, and vestibulo-ocular reflex (VOR) tests of lateral semicircular canal function utilizing caloric stimulation. Caloric testing was carried out as a routine videonystamogram procedure. The right and left ears received standard bithermal irrigations at 30 °C and 44 °C, respectively. Using the Jongkee's Index formula, the calorie-relative vestibular reduction (RVR) was determined. Testing for sinusoidal earth-vertical rotation was done in the dark. The video head impulse test (vHIT) was performed utilizing an ICS Impulse 3-Dimensional vHIT machine. Based on the defined clinical indicators, the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were also computed for each unique test.

Results: The caloric test (AUC 0.840, 95% confidence interval [CI] 0.773–0.907) was the greatest single predictive parameter overall, whereas the vHIT gain test had the lowest AUC of any single test (AUC 0.704, 95% CI 0.612–0.795). There was not a significant difference in any one test's ability to predict the existence of peripheral vestibular impairment ($p > 0.05$). When the rotary chair test ($p = 0.039$) or the caloric test ($p = 0.007$) were added, the vHIT test scores improved considerably. Testing for calories and rotation demonstrated great specificity (83.54% and 78.48%, respectively) and sensitivity (74.65% and 76.06%, respectively). vHIT showed good sensitivity (47.89%) but poor specificity (89.87%) (Table 1).

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
RVR	74.65	83.54	80.30	78.57
TC	76.06	78.48	76.06	78.48
vHIT Gain	47.89	89.87	80.95	65.74
All tests	33.80	98.73	96.00	62.40

Table 1. The sensitivity, specificity, positive predictive value, and negative predictive value of vestibular testing

Discussion: Meniere's disease was diagnosed in almost 30% of the study population who were in the peripheral vestibulopathy group. Caloric and rotational testing were expected to be beneficial as a first-line screening test for peripheral vestibular injury.[1] According to a study by Hannigan IP et al., the caloric test was most helpful when endolymphatic hydrops was suspected and worked in conjunction with the vHIT in the evaluation of vestibular disorders. Meniere's illness was most frequently linked to asymmetric caloric function, which can also serve as a diagnostic flag when there were normal horizontal head impulse testing.[3]

Conclusion: The current study concluded that vestibular function tests each have their own advantages but were all similarly useful for diagnosis. The best tests for detecting peripheral damage might be calorie-based and rotational tests, and virtual hemolysis could be the perfect confirmatory test.

Caloric and rotational tests may be useful screening methods, whereas the video head impulse test (vHIT) was a good confirmatory examination with high specificity.

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1. Fattahi CB et al. Comparative utility of vestibular function tests in patients with peripheral and central vestibular dysfunction. Journal of Otology. 2023 Nov 3. (In Press)
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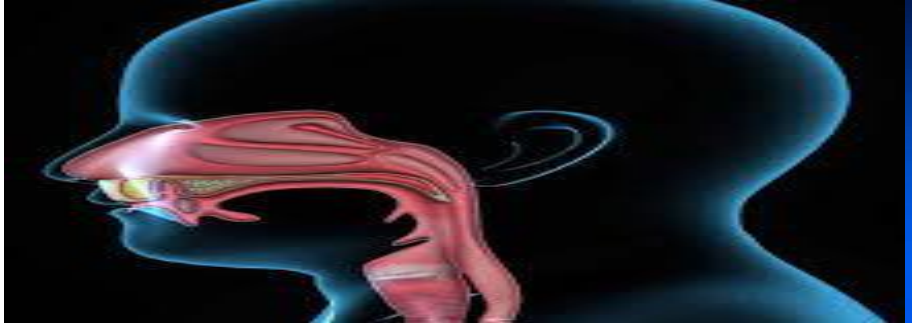
Assessment of prognostic variables and overall survival in diabetic patients with invasive fungal rhinosinusitis

Introduction: Individuals diagnosed with uncontrolled diabetic mellitus (DM) are known to have impaired immune systems and are more vulnerable to infections. In addition to blocking the generation of polymorphonuclear cells, neutrophil migration, and the creation of neutrophil extracellular traps, hyperglycemia stimulates protein kinase C. Phagocytic activity and chemotaxis lose their efficacy.[1] Invasive fungal rhinosinusitis (IFRS) is a life-threatening condition with a mortality rate of 50–80% with severe consequences. The clinical manifestations of IFRS, which include headache, fever, face swelling, and discomfort, as well as signs of adjacent structure invasion such as ophthalmoplegia and vision difficulties, were comparable between the two most frequent fungus, aspergillosis and mucormycosis. Common consequences include cavernous sinus extension, angioinvasion, expansions into the orbit, and extensive tissue necrosis. The frequency of IFRS in diabetic individuals is rising in line with the prevalence of diabetes.[2] In contrast to patients with hematologic malignancy, another underlying immunocompromised condition, people with DM had a higher survival rate for IFRS. One important element that should be taken into consideration while predicting the



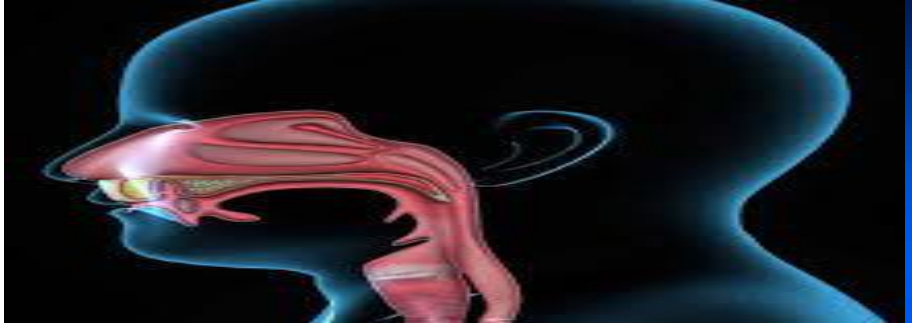
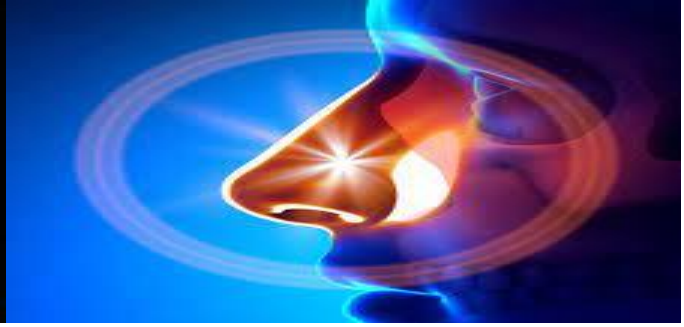

overall survival of diabetes patients with IFRS was their immunological condition. Positive therapeutic results were possible if the compromised immunological status can be restored.[1] The purpose of this study was to determine critical predictive markers for overall survival in diabetic patients with IFRS.

Methods: About 65 diabetic individuals with IFRS were included in this retrospective analysis. The overall survival rate was the study's primary outcome. The prognostic variables for overall survival were secondary outcomes. The time interval between the admission date and the death date or the final follow-up date was noted. Prognostic variables included advanced age, elevated HbA1C, ketoacidosis, white blood cell count, hyperglycemia, duration of diabetes mellitus, current use of diabetic medications, serum creatinine level, and the extensions of IFRS to the orbit, cavernous sinus, and intracranial cavity were all analyzed.

Results: Mucormycosis and aspergillosis were diagnosed in 35.4% and 35.4% of the patients, respectively. There was 21.5% mortality rate. Mortality was predicted by the IFRS expansions to the intracranial cavity (hazard ratio 3.4, 95% CI [1.1–11.3], p = 0.05) and cavernous sinus (hazard ratio 5.1, 95% CI [1.4–18.2], p = 0.01). The mortality risk was reduced by current diabetes medication use (hazard ratio 0.2, 95% CI [0.1–0.9], p = 0.03). The 6-month overall survival rates of patients with and without cavernous sinus extension were 51.4% and 83.6%, respectively (p = 0.001); with and without intracranial extension, 53.3% and 88.9%, respectively (p = 0.001); and with and without current diabetes medicines, 82.3% and 57.5%, respectively (p = 0.045). (Table 1)

Overall survival (%)	1 month	3 months	6 months	*p*-value
Intracranial extension	65.2	60.2	53.3	0.001
No intracranial extension	97.3	88.9	88.9	
Cavernous sinus extension	60.0	51.4	51.4	0.001
No cavernous sinus extension	93.3	86.4	83.6	
Current no use of diabetic medications	74.5	67.0	57.5	0.045
Current use of diabetic medications	89.3	82.3	82.3	

Table 1: Comparison of the overall survival of diabetic individuals with risk factors for invasive fungal rhinosinusitis at 1, 3, and 6 months to those without.

Discussion: Thirty-five percent of the patients in this study had aspergillosis, and thirty-five percent had mucormycosis. Acute IFRS was present in 56 individuals (86.2%), while chronic IFRS was present in 9 patients (13.8%). There was a 21.5% mortality rate. The 6-month overall survival rate for individuals with cavernous sinus extension was 51.4%, compared to 83.6% for patients without cavernous sinus extension.[1] According to a study by Nyunt TP et al., aspergillosis accounted for 24.2% of IFRS cases, whereas mucormycosis accounted for 62.9%. Acute IFRS was detected in 221 individuals (93.4%), while chronic IFRS was diagnosed in 17 patients (6.7%). The percentage of deaths was 31.8%. The cavernous sinus extension was found to be a significant risk factor by univariable logistic regression analysis.[2]

Sphenoid sinus involvement, posterior ethmoid sinus involvement, facial pain, impaired vision, and periorbital swelling were identified as predictive indicators for the risk factors of orbital problems in IFS patients. An organ or hematopoietic cell transplantation history was associated with a lower chance of survival for IFS patients; on the other hand, surgical intervention and elevated hemoglobin and albumin levels were associated with a higher chance of survival.[3]

Conclusion: The current study concluded that patients with DM had a higher risk of death when IFRS was extended to the cerebral cavity and cavernous sinus. The current use of diabetes medicines was the most important predictor of survival.

Controlling diabetes complications and restoring immunological dysfunction in order to improve patient survival.

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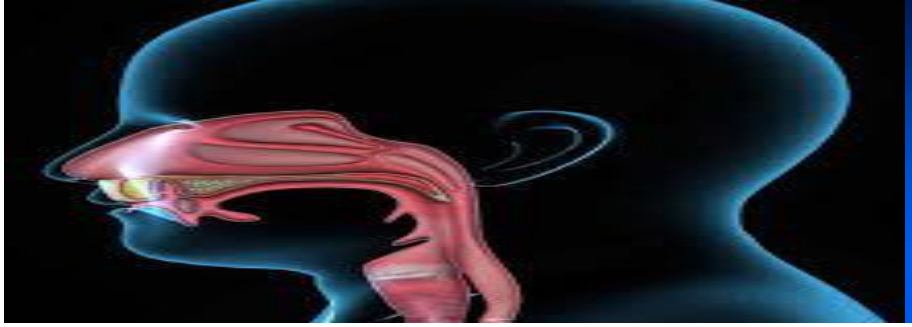


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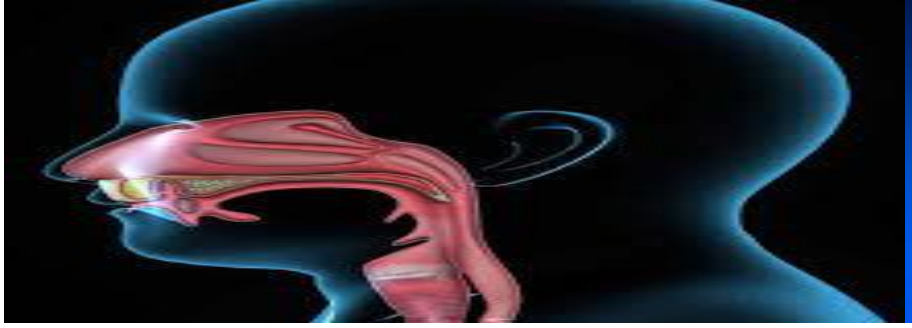
Evaluation of the Differences between Surgical Tracheostomy and Real-Time Ultrasound-Guided Percutaneous Dilatational Tracheostomy in Critically Ill Patients

Introduction: Tracheostomy is one of the most common operations performed in intensive care units (ICUs) and may become increasingly widespread as the need for intensive care services grows. Although open surgical tracheostomy (ST) is the conventional treatment, it has a relatively high risk of peristomal infections and perioperative hemorrhage. Percutaneous dilatational tracheostomy (PDT) was first used in 1985 and has subsequently become a regular bedside treatment. PDTs are more advantageous than open STs in terms of cost-effectiveness, shorter operation times, reduced bleeding-related mortality, and decreased risk of wound infection.[1] Bronchoscopy-guided PDT was extensively used because it can determine the location of the trachea during a puncture and prevent injury to the posterior tracheal wall. However, identifying cervical anatomical structures, including arteries or the thyroid, can be difficult and requires a professional to utilize a bronchoscope. However, because it can detect anatomical features, ultrasound-guided PDT (US-PDT) was anticipated to provide benefits such as portability and safety. Real-time ultrasound has been shown in several trials to offer advantages over bronchoscopy. However, there weren't many studies to compare ST with US-PDT.[2] The purpose of this randomized controlled trial was to establish the safety and efficacy of US-PDT in comparison to ST.

Methods: A total of 70 individuals who underwent ST or US-PDT were involved in this randomized controlled study. Patients were randomized into two groups: ST (n = 35) and US-PDT (n = 35). The US-PDT surgery was conducted using the Ciaglia Blue Rhino tracheostomy kit (Cook Medical Inc.). The best level of tracheal puncture was determined using real-time ultrasound after a local anesthetic injection and palpation marking of the anatomical landmarks. The ST was carried out according to procedure. After administering a local anesthetic, a horizontal skin incision was performed, and the trachea was exposed using a sharp and blunt dissection. Using a portable fiberoptic laryngoscope, the endotracheal placement of the T-tube was confirmed. Clinical features of the patient, procedure time and specifics, complications, length of ICU stay, amount of time needed to wean off artificial breathing, and hospital mortality were assessed.




Results: There were no significant differences in the groups in terms of age, gender, BMI, APACHE (Acute Physiology and Chronic Health Evaluation), or duration of intubation. Three patients in the US-PDT group and two in the ST group had anatomical issues. One patient from the ST group had limited neck extension. There was no statistically significant difference in the endotracheal tube size or intubation depth between the two groups. (Table 1) Compared to ST, the US-PDT technique consumed a shorter duration. Additionally, the US-PDT incision length was shorter than the ST (1.5 ± 0.5 cm vs. 1.8 ± 0.4 cm). The procedure time and the USG-guided E-tube repositioning time added together made the overall duration in the US-PDT group 6.9 ± 2.8 minutes, which was considerably less than in the ST group (P = 0.001). In the US-PDT group, the relocated E-tube depth was 18.0±0.7 cm for males and 16.7±1.3 cm for women (P = 0.004). Data on demographics, surgery specifics, complications, length of stay in the intensive care unit, time spent weaning off the ventilator, and hospital mortality did not show statistically significant differences.

Variable	ST (n=35)	US-PDT (n=33)	*P*-value
Age (yr)	67.7±13.7	65.6±13.8	0.516
Sex (male:female)	21:14	20:13	0.959
Body mass index (kg/m^2)	21.9±5.0	22.3±5.2	0.753
APACHE II score	21.5±8.8	24.4±9.7	0.214
Intubation period (day)	13.6±9.8	14.3±6.1	0.732
Anatomical difficulty	2	3	0.594
Limited neck extension	1	0	0.328
Intubation depth (cm)	22.9±1.4	23.0±1.5	0.622
Endotracheal tube size (mm)	7.8±0.5	7.8±0.5	0.722

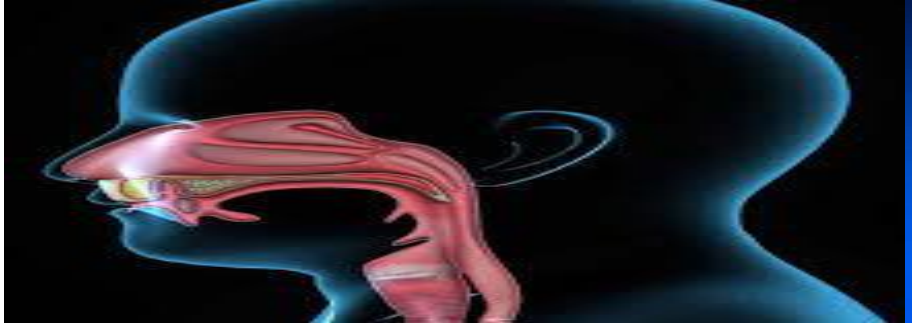
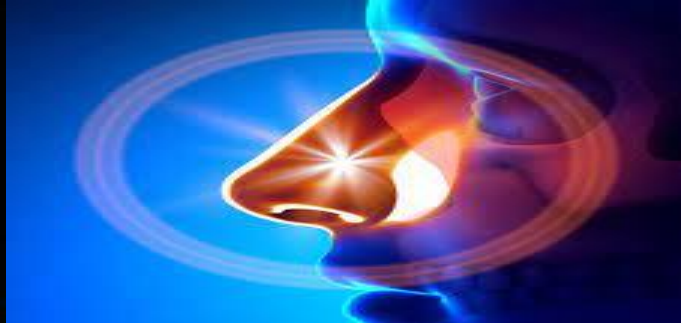
Values are presented as mean±standard deviation.

Table 1: Demographic information and data collected from patients prior to ST and US-PDT procedures

Discussion: The study conducted by Kang HT et al. revealed that even with ultrasound-guided tube repositioning, the US-PDT group's procedural time (5.2 ± 3.1 minutes) was considerably lower than the ST group's (10.5 ± 5.0 minutes) (p < 0.001). For patients who were at high risk or who were not able to be transported, US-PDT could be a viable substitute for ST.[1] The results of the current investigation indicated that the US-PDT procedure time was less than the ST procedure time. US-PDT can be performed safely and successfully in critically ill patients, and it may be a viable alternative to ST.[2] Sarıtaş A et al. demonstrated that ultrasound-guided percutaneous dilatational tracheostomy was a safe procedure with a low rate of complications, a short procedure duration, the ability to provide information about neck anatomy, and the ability to facilitate the prevention of vascular puncture for critically ill patients.[3]

Conclusion: The current study concluded that US-PDT has a comparable complication rate and a shorter procedure time than ST. It can be performed safely and effectively on critically ill patients, and it may be a viable alternative to ST.

In comparison to surgical tracheostomy, ultrasound-guided PDT (US-PDT) required less time during the surgery and a shorter incision.

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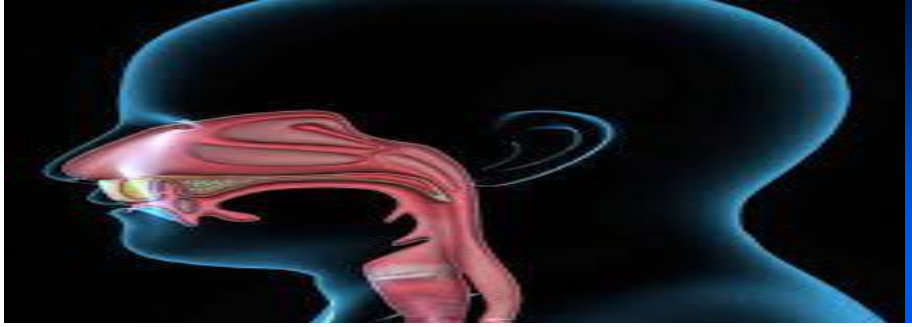
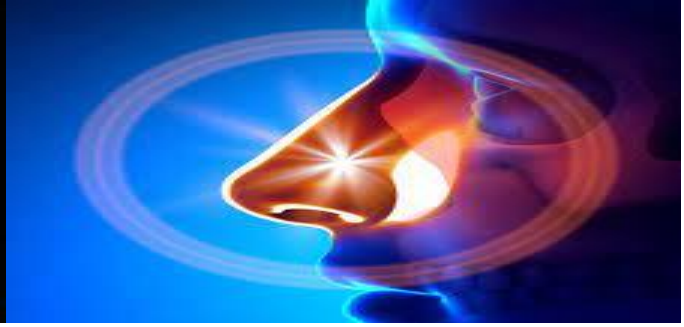
A rare case of Barakat syndrome characterized by isolated sensorineural hearing loss

Introduction: Hypoparathyroidism (H), sensorineural deafness (D), and renal disease (R) were the trio of Barakat syndrome, sometimes referred to as HDR syndrome. Barakat syndrome was a rare genetic condition that was clinically diverse. The zinc-finger transcription factor GATA3 mutations or deletions on chromosome 10p14 were the most common cause of the syndrome. Patients have historically mostly shown signs and symptoms of hypocalcemia brought on by hypoparathyroidism.[1] Sensorineural hearing loss, the most consistent symptom of the disease, was often bilateral and can be mild to severe. Renal involvement encompasses hematuria, renal dysplasia, hypoplastic or aplastic kidneys, vesicoureteral reflux, pelvicalyceal malformation, and nephrotic syndrome.[2] This was an uncommon pediatric instance of Barakat syndrome presented as solitary congenital sensorineural hearing loss with no symptoms of hypoparathyroidism or renal illness.

Case presentation: A one-month-old female baby was taken to the hospital after a newborn hearing screen failed. After maternal hypertension developed, the patient was delivered by induced vaginal birth at a gestational age of 37 weeks and 6 days. She was the firstborn child of a G1P001 mother who was 38 years old and free of any further pregnancy difficulties. Non-invasive prenatal testing (NIPT), which was used to conceive the patient, showed no anomalies. There was no history of sensorineural hearing loss, vision loss, renal problems, or endocrine diseases, but the mother's carrier status for cystic fibrosis was important based on family history. It was discovered that neither parent carried an additional autosomal recessive disorder after expanded carrier screening panel testing, which included connexin-related hearing loss.

Positive pressure ventilation (PPV) was used on the patient, who initially showed signs of apnea and continued until 2.5 minutes of life, at which point his oxygen saturation was over 98% on room air. Testing for congenital cytomegalovirus (CMV) during the neonatal period revealed negative results. The patient's two ears failed a neonatal hearing screen. Bilateral mild-to-severe sensorineural hearing loss was identified by auditory brainstem response testing (ABR) at one month of life. Brain magnetic resonance imaging (MRI) at two months of age showed that there were no additional inner ear anomalies, auditory nerves were present, and cochleae were normal (Figure 1). At three months of age, a repeat ABR test revealed bilateral stable hearing loss.

The patient received early intervention enrollment and hearing aid fitting as a result of these findings. At six months of age, a heterozygous mutation in exon 4 of GATA3, nonsense variation C.907 A > T p. (K303*), was discovered by genetic testing. This mutation was consistent with Barakat syndrome. Results from the laboratory did not show hypoparathyroidism or abnormal electrolyte levels. A renal ultrasonography revealed no abnormalities in the morphology or structure of the kidneys. A follow-up electrocardiogram (EKG) revealed a normal range of QTc (419 ms) for the patient's age. The transthoracic echo showed no structural abnormalities and appropriate valve structure and function. Following a period of 16 months, the patient showed no signs of renal or parathyroid disease. For ongoing monitoring, she was closely monitored by pediatric nephrology and endocrinology.

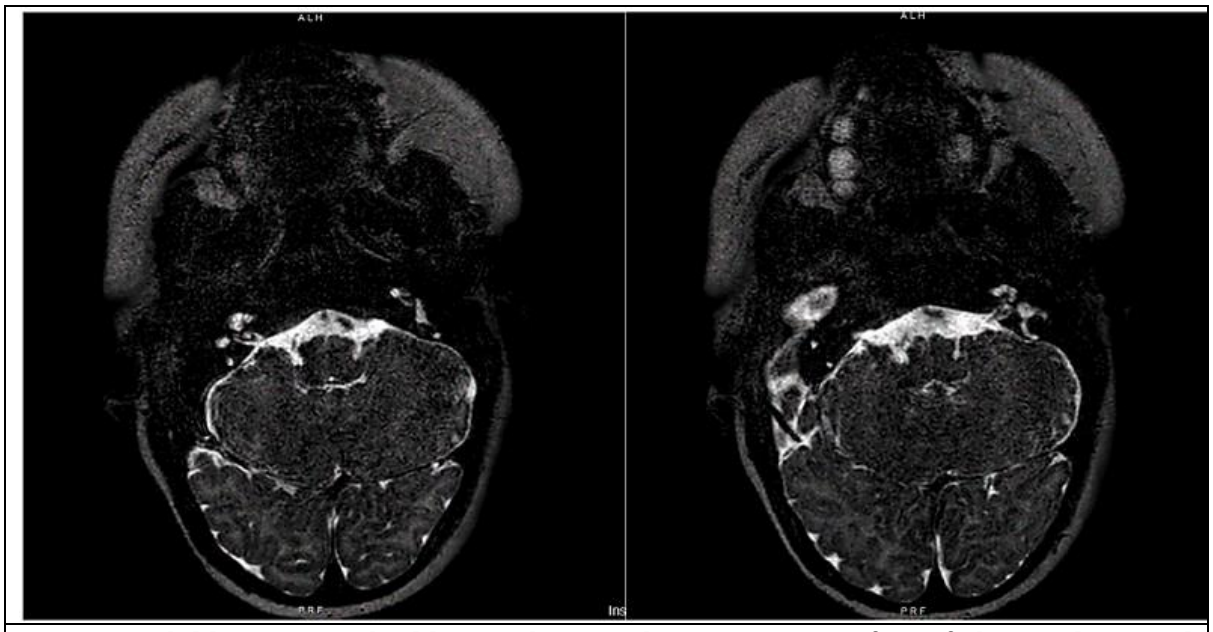
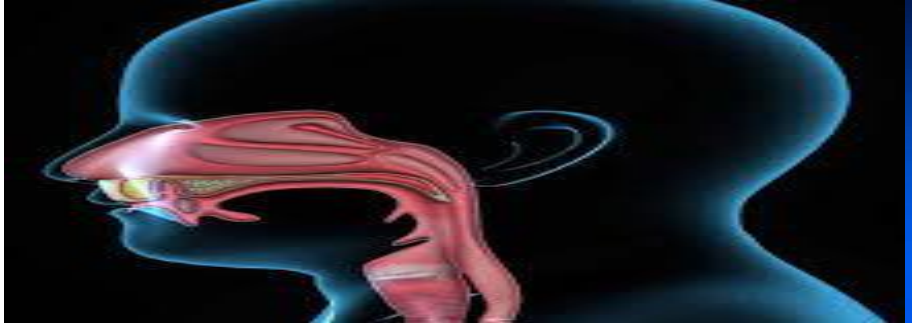
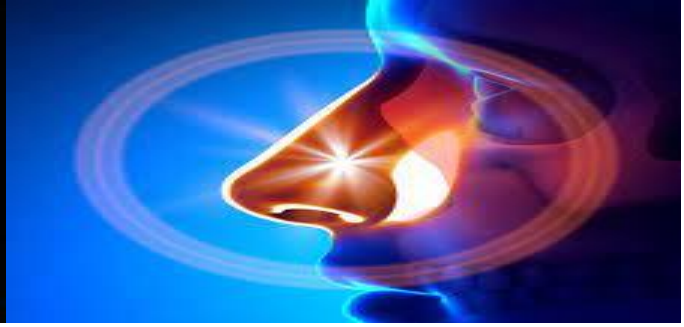


Figure 1: Child's two-month-old MRI showing the inner ear was free of abnormalities and that the cochlea was functioning normally

Discussion: The most common characteristic of Barakat syndrome was hearing loss. It affected 96% of reported patients and causes early-onset, moderate-to-severe sensorineural hearing loss that was frequently bilateral and worse at higher frequencies. Early intervention was crucial for children with hearing loss to optimize their speech, language, and social abilities.[1] Early-onset bilateral sensorineural hearing loss with larger losses at higher frequencies has previously been identified as a feature of Barakat syndrome (HDR syndrome). Out of 180 instances in the largest review to date, 64.4% of cases had all three distinctive symptoms; the most common symptom, occurring in about 96.7% of patients, was hearing loss, followed by hypocalcemia (93.3%) and renal involvement (72.2%). Renal dysfunction and hypocalcemia (4.4%) and hearing loss with hypocalcemia (27.2%) were the next most frequent presentations; isolated hearing loss accounted for the least number of cases, at 0.6%.[3]

Conclusion: All patients with Barakat syndrome did not had full-spectrum hypoparathyroidism, hearing loss, or kidney failure. Therefore, the harmful effects of renal involvement and hypoparathyroidism can be lessened by early identification, proactive monitoring, and intervention.

Clinical recognition of Barakat syndrome was difficult due to its widely varied presentation. Otolaryngologists should evaluate Barakat syndrome when evaluating patients with isolated congenital sensorineural hearing loss.

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