resulting into the parallel or spiral type. In the parallel type, the 2 ducts are usually joined with fibrous tissue which might express great difficulty in their exposure and separation during cholecystectomy. The ratio of the spiral type of junction was slightly lower than that found in America (8%), but markedly lower than that reported in Britain which equaled to 25%. The liver seemed to be enlarged in 22% of the cases. This might be attributed to mild or recurrent attacks of malaria, infective hepatitis or typhoid, which are common endemic tropical diseases in Khartoum, Sudan. Furthermore, the gall bladder also seemed to be enlarged in a relatively similar ratio to that of the liver. Whether this enlargement is a genetic predisposition, secondary to stretch by the enlarged livers or mere casual coincidence, needs further interpretation. The common hepatic ducts were not found in 3% of the cases. Uncommonly, 3 hepatic ducts were found in 4 subjects amounting to 2% of the cases. The bile duct was found to open separately in the duodenal wall or inside its lumen in 13.5% of the cases. This ratio was relatively lower than those reported by early workers. This might be due to a difficulty in manual palpation of the common bile ducts during surgery. Generally, the incidence of anatomical variations of the extra biliary ducts among Sudanese citizens in Khartoum, Sudan, was relatively similar to those found elsewhere.

In comparison to the anatomic variations of the extra biliary ducts among Sudanese citizens in Khartoum, Sudan, to those found elsewhere, the incidences of the spiral type of junction between the cystic duct and the common hepatic duct and the separate opening of the common bile duct into the duodenum showed relatively lower ratios. Absence of the common hepatic ducts registered a brisk value. Three bile ducts were found in 2% of the cases.

The incidence of the anatomic variations of the extra biliary ducts among Sudanese citizens in Khartoum, Sudan, is relatively similar to those found elsewhere.

*Received 10th March 2004. Accepted for publication in final form 9th May 2004.*

*From the Department of Anatomy, College of Medicine, King Faisal University, Dammam, Kingdom of Saudi Arabia. Address correspondence and reprint request to Dr. Mohamed A. Bakheit, Anatomy Department, College of Medicine, King Faisal University, PO Box 2114, Dammam 31451, Kingdom of Saudi Arabia. Tel. +966 (3) 8577000 ext. 2068. Fax. +966 (3) 8575329. Email. mabuoaf@yahoo.Com*

## *References*

1. Ozgen A, Akata D, Arat A, Demerkazik FB, Ozmen MN, Akhan O. Gall bladder duplications: Imaging findings and differential considerations. ***Abdom Imaging*** 1993; 2: 285-288.
2. Kohler R, Viljanev V. Spiral type junction of the cystic and common hepatic ducts investigated by operative cholangiography. ***Acta chirurgica Scandinavica*** 1993; 28: 85-88.
3. Uetsuji S, Okuda Y, Komada H, Yamamura M, Kamiyama M. Clinical evaluation of a low junction of the cystic duct. ***Scand J Gastroenterol*** 1993; 28: 85-88.
4. Yoshida J, Chijiiwa K, Yamaguchi K, Yokohata K, Tanaka M. Practical classification of the branching types of the biliary tree: an analysis of 1,094 consecutive direct cholangiograms. ***J Am Coll Surg*** 1996; 1182: 37-40.
5. Taourel P, Bret PM, Reinhood C, Barkun AN, Atri M. Anatomic variants of the biliary tree: diagnosis with MR cholangiopancreatography. ***Radiology*** 1996; 199: 521-527.
6. Carmi R, Magee CA, Neill CA, Karrer FM. Extra hepatic biliary atresia and associated anomalies. ***Am J Med Genet*** 1993; 45: 683-693.
7. Moore KL, Persaud TV. The Developing Human. 7th ed. Philadelphia (PA): WB Saunders Company; 2003. p. 259-263.
8. Snell RS. Clinical Anatomy for Medical Students. 7th ed. Baltimore, Philadelphia (PA): Lippincott Williams & Wilkins; 2004. p. 267-273.

# Tracheostomy in pediatric intensive care. *Analysis of 5-year-experience and review of literature*

***Mohamed S. Kabbani,*** *MD,* ***Ali Al-Eathan,*** *MD,* ***Maha Azzam,*** *MD,* ***Hala Al Alem,*** *MD,* ***Abdulrahmen Abu-taleb,*** *MD,* ***Omar Hijazi,*** *MD*

In the pediatric intensive care unit (PICU), prolonged endotracheal intubation is known to be associated with many complications, these may include local trauma, tube displacement, nosocomial infection, aspiration around the tube, tracheal mucosal dysfunction and others.[1] The negative impact of prolonged translaryngeal intubation on the patient has led to the replacement of the translaryngeal tube with a tracheostomy tube.

The optimal time to replace the translaryngeal tube with tracheostomy tube is a controversial subject. The American Association of Chest Physicians recommended tracheostomy tube insertion in adult patients, when the anticipated need for artificial airway is more than 3 weeks.[1] In children, however, there are no specific guidelines for tracheostomy. Furthermore, it has shown that tracheostomy in pediatric patients has a higher morbidity and mortality compared to adult patients.[2] The decision to perform tracheostomy in a child can be difficult and complex, the physician often faces many challenging questions related to family acceptance, indication, timing, future care, and the risk associated with the procedure. To evaluate the role of tracheostomy in critically ill children, we reviewed retrospectively all pediatric patients who underwent tracheostomy in our hospital between 1997 and 2002. Our aim was to look at the

prevalence, current indications, timing and short-term outcome of pediatric tracheostomy.

During the 5 years study period, 35 children (21 male) averaging 4.7±0.5 years underwent tracheostomy. They represent 2% of all PICU admissions. Sixty percent of the patients were below 5 years of age, 24 patients (68%), had underlying neurological insult. The nature of this neurology insult, were head trauma in 9 patients (25%) and non-traumatic brain insult in 15 patients (43%). The latter included different types of central nervous diseases such as cerebral palsy, meningitis or encephalitis, ventriculoatrial, and hypoxic brain insult. Six patients (16%), had only upper airway abnormality with no other underlying medical condition and the rest of our patients (16%) had miscellaneous causes such as systemic or neuro-motor diseases. In 26 patients, at least one extubation trial was attempted and in 9 patients, no trial of extubation was carried out. These cases were judged to be clearly ventilator dependent or to have significant neurological insult with absent gag and cough reflexes. On average, patients requiring tracheostomy had glasgow coma scale (GCS) of 9±1, and remained intubated for 17.4±2.2 days prior to tracheostomy tube insertion. The indications for tracheostomy in the 35 cases were subglottic stenosis in 37% of the cases, tracheobronchial toilet in 22%, tracheo laryngomalacia in 14%, ventilator dependent in 11% and miscellaneous causes in 16%. After tracheostomy, 25 patients were successfully weaned off ventilator and 2 needed prolonged ventilation. The mean ventilation days were pre-tracheostomy 17.4±2.2 and post-tracheostomy 6.6±3 days. A total of 27 (77%) patients survived, out of which, 15 were discharged and the remaining 12 underwent rehabilitation. The mean length of PICU stay were pre-tracheostomy 21.5±2.6 and post-tracheostomy 10.8±3 days. In total, 8 (23%) patients died post-tracheostomy, 3 patients in PICU and 5 after being discharged from the PICU. Causes of death were directly related to the underlying pathology in all patients except one. The tracheostomy related fatality was a 7-year-old girl, who developed massive sudden tracheal bleeding and aspiration after one month of her tracheostomy; caused by innominate fistulae.

In the last 20 years, tracheostomy cases have increased and the indications have changed. Epiglottitis, tracheobronchitis and prematurity used to be the leading indications for tracheostomy in many places.[3] In our PICU, we found that the main indications for tracheostomy were subglottic stenosis, broncho-pulmonary toilet, tracheomalacia and ventilator dependency, particularly in patients with neurological insult. Other medical centers have reported different indications for tracheostomy. In 2 studies, craniofacial anomalies were found to be among the leading indications for tracheostomy.[4] These variations between medical centers might be due to different patient populations.

Optimal timing for pediatric tracheostomy is not defined in the medical literature. In the adult population, tracheostomy is advocated if the patient requires intubation for more than 3 weeks. Furthermore, there are more recent randomized prospective studies supporting the insertion of tracheostomy tube as early as 5 to 7 days in intubated adult patients with multiple injuries. This has been shown to decrease the total number of ventilation days and to shorten the length of stay in critical care areas.[5] Similar experience in pediatric literature is very limited. In one study, the average timing for tracheostomy tube insertion was 13.5 days for 30 children with traumatic brain injury.[6] In our patients, the average time for tracheostomy tube insertion was 17.4±2.2 days post initial intubation. Following tracheostomy tube insertion, most of our patients (91%) were weaned and successfully disconnected from ventilator. Only 2 patients (6%) failed to be liberated from mechanical ventilator. The anticipation of a need for tracheostomy is not always easy or clear. Physicians tried to look for clinical predictors of tracheostomy in adult intensive care unit (ICU) patients. Some of these predictors were found to be the development of nosocomial pneumonia, and the need for reintubation.[7] The incidence of the previous 2 variants in our patients was 45% and 74%. Additionally, We have observed that nearly 75% of our pre-tracheostomy patients had some degree of hypoxia reflected by $PaO_2/FiO_2$ ratio below 400 and altered level of consciousness reflected by GCS of 8 or below. There appears to be an association between low GCS, low $PaO_2/FiO_2$ ratio and the need for tracheostomy, particularly in patients with brain insult. As the retrospective nature of our study, we cannot claim any of these variants to be a true predictor for pediatric tracheostomy. We believe however, that further studies are needed to verify the role of each of these variants as predictors for tracheostomy need, in pediatric ICU patients.

It is well known that the morbidity and mortality associated with tracheostomy are higher in children than in adults.[2] In general, the overall mortality rate in children with tracheostomy ranges between 11-40%.[8] In this series, the overall mortality rate was 23% and the tracheostomy related deaths were 3%. Similar to other reported series, the mortality in our tracheostomy patients was mainly related to the underlying diseases.[8]

In conclusion, the majority of tracheostomy cases performed in our PICU were carried out for airway obstruction, prolonged ventilation, and chronic airway management particularly for patients with neurological insults. There are some suggestive

features that appear frequently in intubated patients who may require later tracheostomy. Ventilator-associated pneumonia, low GCS, and the need for reintubation are possible risk factors for tracheostomy. Optimal time for tracheostomy varies with age and underlying pathology that lead to the need for it. The majority of the patients can be discharged from PICU post-tracheostomy; however, the mortality and outcome of pediatric tracheostomy patients depends primarily on the underlying medical condition.

*Received 21st December 2003. Accepted for publication in final form 30th March 2004.*

*From the Department of Pediatric and Cardiac Science, King Abdul-Aziz Medical City, Riyadh, Kingdom of Saudi Arabia. Address correspondence and reprint requests to Dr. Mohamed S. Kabbani, Department of Cardiac Science, Mail Code 1413, King Abdul-Aziz Medical City, PO Box 22490, Riyadh, Kingdom of Saudi Arabia. Tel. +966 (1) 2520088 Ext. 6671. Fax. +966 (1) 2520088 Ext. 6700. E-mail: mskabbani@hotmail.com*

## *References*

1. Plummer AL, Gracey DR. Artificial airways in patients receiving mechanical ventilation (Consensus conference). ***Chest*** 1989; 96: 178-180.
2. Shinkwin CA, Gibbin KP. Tracheostomy in children. ***J R Soc Med*** 1996; 89: 188-192.
3. Ward RF. Current trend in pediatric tracheotomy. ***Pediatr Pulmonol*** 1997; 16: 290-291.
4. Puhakka HJ, Kero P, Valli P, Iiasalo E. Tracheostomy in pediatric patients. ***Acta Paediatr*** 1992; 81: 231-234.
5. Sugerman HJ, Wolfe L, Pasquale MD, Rogers FB, O'Malley KF, Knudson M, et al. Multicenter, randomized, prospective trial of early tracheostomy. ***J Trauma*** 1997; 43: 741-747.
6. Citta-Pietrolungo TJ, Alexander MA, Cook SP, Padman R. Complications of tracheostomy and decannulation in pediatric and young patients with traumatic brain injury. ***Arch Phys Med Rehabil*** 1993; 74 Suppl: 905-909.
7. Kollef M, Ahrens T, Shannon W. Clinical predictors and outcomes for patients requiring tracheostomy in the intensive care unit. ***Crit Care Med*** 1999; 27: 1714-1720.
8. Dutton JM, Palmer PM, McCulloch TM, Smith RJ. Mortality in the pediatric patient with tracheotomy. ***Head Neck*** 1995; 17: 403-408.

# Pattern of gastroenterology psychiatric consultations. *A prospective study*

***Abdulrazzak M. Alhamad,*** *BC Psych, JB Psych.*

The relationship between gastrointestinal (GI) complaints and psychiatry remains complex.[1] As, 1. more than 25 functional GI disorders were described and they were found to be extremely common, where in some household surveys in the United States of America, their rate exceeded 65%,[2] 2. patients with functional GI disorders have a significantly higher rate of physical or sexual abuse in childhood, and a high prevalence of psychiatric disorders compared with the general population.[1,2] Another complicating factor is the finding that patients with bowel disturbances are less likely to visit doctors for their GI symptoms until they are amplified by depression, anxiety, pain and recent negative life events.[2] Areas of GI disorders of interest to psychiatry are numerous and variable such as irritable bowel syndrome (IBS), esophageal motility disorder, liver and small intestine transplant, gastritis, ulcerative colitis, peptic ulcer, globus hystericus, endoscopy and constipation.[2,3] This study is an attempt to explore the clinical aspects of GI psychiatric consultations prospectively in a teaching hospital in the Kingdom of Saudi Arabia (KSA).

Consecutive GI referrals to psychiatry at the King Khalid University Hospital (KKUH), Riyadh, KSA, were assessed prospectively using a data collection form including all sociodemographic data and clinical indices of the consultation under the supervision of the author for 3 years from 1990 to 1992. King Khalid University Hospital is a university general hospital with 630-beds and the gastroenterology division during the study, had 16 beds with 5 consultants in-charge. The Stat Pac Gold statistical analysis package was used. Twenty-six patients were referred over 3 years with mean age of 40.2±24.548, ranging from 18-82 years and a male to female ratio of 1:1.9. Other sociodemographic data are shown in **Table 1**. The total referral rate over 3 years was 2.7% and for each year was 2.1% (1990), 2.4% (1991), and 3.3% (1992). Time lag of referral which is the time between admission and referral to psychiatry, ranged from 0-14 days with a mean of 2.87±3.833 days and the mean duration of admission was 14.73±11.473 days with a range of 1-41 days. The reason for the referrals was for psychiatric evaluation of a suspected psychiatric disorder in 76.9% of the cases. Only 7.7% of patients were informed of the referral, but 92.3% accepted the psychiatric referral and 84.6% accepted the psychiatric treatment. None of the discharges were agreed with the psychiatrist, but in 84.6% of the cases the psychiatrist was notified. Approximately 46.2% of the cases were treated by psychotropic drugs only and 30.7% were treated by psychotropic drugs and other form of psychotherapy and 50% of the cases showed a marked improvement. The diagnostic and statistical manual (DSM-III-R), for psychiatric diagnosis analysis showed 34.6% of the patients had major depression and 15.4% had generalized anxiety disorder (GAD) and panic disorder, other diagnoses in concordance with GI diagnoses are shown in **Table 2**. This perspective study highlights some important aspects of consultation-liaison (C/L) between psychiatry and gastroenterology. Gastrointestinal psychiatric