

The presence of intestinal gas beyond the duodenum indicates incomplete obstruction, in this case a mid gut volvulus cannot be excluded and even in absence of its evidence, urgent exploration is recommended as soon as the patient is stable. Intestinal perforations are very rare complications. In cases of feeding difficulty or recurrent vomiting with unclear double bubble shape on the abdominal radiograph, other radiological modalities play an important role in the work up of more than direct diagnosis. Some cases of an incomplete obstruction are not recognized until adult life, usually diagnosed during the work up of peptic ulcer.<sup>4</sup> A thorough clinical examination to rule out other congenital anomalies, resuscitation, and gastric decompression, should precede the systematic and methodic surgical exploration. The type of the anomaly could orient on the etiology of congenital duodenal obstruction: malrotation, anterior portal vein. Associated biliary and intestinal anomalies must be considered before abdominal closure. We do not dissect the biliary tract unless an evident anomaly is seen. Simple malrotation without atresia is treated by the Ladd procedure, and the simple web or short stenosis needs plasty or resection, for all other cases we performed a trans mesocolic duodenojejunal anastomosis stented by a trans anastomotic feeding tube size 6 Fr for 2 weeks. This method provided full satisfaction due to its simplicity, early oral feeding tolerance as early as 4 days post op and early discharge with a small feeding tube shortened to the paranasal area and fixed by a simple adhesive tape. Whatever the surgical technique, the slow anastomotic function is a common problem in duodenojejunal anastomosis, which is not always feasible and may require more extensive dissection to approximate the duodenal ends.<sup>5</sup> Duodenal tapering runs a higher risk of fistula and injury to the ampulla of Vater.<sup>8</sup> Currently, the laparoscopic approach is recommended,<sup>9</sup> yet whatever the surgical technique employed, trans anastomotic stent provides early oral feeding without adjunct complication. There were no complications related to the stent in our series. Endoscopic excision is reserved for partial web, fiber optic endoscopy identifies the obstruction and endoscopic retrograde cholangio-pancreatography has been able to document the abnormalities of the bile and pancreatic ducts system. Post operative complication had been reported in 70%, with 18% surgical redo surgery, anastomotic leak, and delay in feeding tolerance from 6-45 days. Long-term complication includes alkaline reflux and peptic ulceration, duodenal stasis with blind loop syndrome, recurrent abdominal pain or diarrhea. Gallstone has been also reported following duodenal atresia repair. Generally, the survival in infants with duodenal anomalies is more than 95%. Mortalities are the result of severe cardiac anomalies. Growth

retardation and development delay are also very rare out of major associated anomalies.

In conclusion, congenital duodenal obstruction is a frequent anomaly; total parenteral nutrition as well as the great progress in the neonatal intensive care improved the outcome greatly. Trans mesocolic duodeno-jejunal anastomosis with TNJT provides early oral feeding and has no inherent specific complications.

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## References

1. Calder E. Two examples of children born with prenaternal conformation of the guts. *Med Essays* (Edinburgh) 1733; 1: 203.
2. Vidal E. 18e Congres de chirurgie, Paris: Proces verbaux memoires et discussion. *Ass Fr Chir* 1905; 18: 739.
3. Ernst NP. A case of congenital atresia of the duodenum treated successfully by operation. *BMJ* 1916; 1: 1644.
4. Cillye RE, Coran AG. Duodenoduodenostomy. In: Spitz L, Coran AG, editors. *Pediatric Surgery*. 5th ed. London (UK): Chapman & Hall; 1995.
5. Kamisawa T, Yuyang T, Egawa N, Ishiwata J, Okamoto A. A new embryologic hypothesis of annular pancreas. *Hepatogastroenterology* 2001; 48: 277-278.
6. Holder-Espinasse M, Ahmad Z, Hamill J, Pahari A, Misra D, Drake D. Familial syndromic duodenal atresia: Feingold syndrome. *Eur J Pediatr Surg* 2004; 14: 112-116.
7. Tashjian DB, Moriarty KP. Duodenal atresia with an anomalous common bile duct masquerading as a midgut volvulus. *J Pediatr Surg* 2000; 36: 956-957.
8. Alexander F, Difiore J, Stallion A. Triangular tapered duodenoplasty for the treatment of congenital duodenal obstruction. *J Pediatr Surg* 2002; 37: 862-864.
9. Seyaert H, Valla JS, Van Hoord E. Diaphragmatic duodenal atresia: laposcopic repair. *Eur J Pediatr Surg* 2003; 13: 414-416.

The prevalence of *Candida dubliniensis* among germ tube positive candida samples isolated from the respiratory tract

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**C***andida dubliniensis* (*C.dubliniensis*) is one of the germ tube and chlamydospore forming *Candida* species, which was first recognized in 1995. It is difficult to differentiate from *Candida albicans* (*C.albicans*) with the standard diagnostic laboratory methods due to their similar phenotypic characteristics. However, *C.dubliniensis* can be

differentiated from *C.albicans* by means of characteristics such as lack of intracellular  $\beta$ -glucosidase activity, inability to proliferate at 42°C and 45°C, formation of typical chlamyospore on cornmeal Tween 80 agar, typical colony and chlamyospore appearance on Staib agar, the formation of dark green colonies on CHROM agar medium at first isolation, XYL (D-xylose) and MDG (a-methyl-D-glucoside) negative appearance at the commercially available fungus identification kits, such as the API 20C AUX and API ID 32C systems, but, nevertheless, identification of the genotypic characteristics by molecular modalities is necessary for a certain diagnosis. The yeast has a widespread geographic location. Although it has been isolated from sputum, blood, vaginal flora, lungs, and feces the vast majority of *C.dubliniensis* isolates obtained to date, have been identified primarily from the oral cavities of individuals infected with human immunodeficiency virus (HIV) and, therefore, were believed to have a particular relation with HIV infection. However, increased number of recent publications reporting *C.dubliniensis* isolation from HIV-negative individuals suggested a need for extensive research on the epidemiology of this yeast. In vitro fluconazole resistance of the *C.dubliniensis* isolates, however, enhance the importance of the isolation of this yeast. In our study, we examined 60 germ tube positive isolates that had been determined as a causative of infection among HIV negative patients hospitalized in various clinics due to respiratory tract infections.

Between June 2003 and May 2004, 60 germ tube positive isolates which were isolated from the respiratory tract samples of patients from various clinics and sent to Ankara University Medical School, Department Of Clinical Bacteriology and Infection Diseases Laboratory, and accepted to be the causative infectious agent, were studied to determine the existence of *C.dubliniensis* at the Department of Microbiology and Clinical Microbiology, Ankara University Medical School. National Institute of Health A strain and *C.albicans* 26555 and *C.dubliniensis* 36 for *C.dubliniensis* were used as controls in the phenotypic and genotypic methods. Samples preserved at -20°C were subcultured by incubating for at least 48 hours under aerobic conditions on Sabouraud Dextrose Agar (SDA, Merck). Among Candida isolates, phenotypic characteristics of *C.dubliniensis* were investigated by analysis of germ tube formation in human serum at 37°C for 3 hours. The degree of chlamyospore production on cornmeal agar supplemented with 1% Tween 80, growth at 45°C on Sabouraud dextrose agar (SDA), colony morphology on Staib agar was recorded. Polymerase chain reaction (PCR) with primers

specific for each species was used for the diagnosis of *C.albicans* and definitive differentiation from *C.dubliniensis*.

**Germ tube and chlamyospore formation.** All isolates were incubated in human serum for 3 hours at 37°C and evaluated for germ tube formation. To determine chlamyospore formation, all isolates were cultured on Tween 80 medium with cornmeal agar and incubated at room temperature and were evaluated on the second, fifth and tenth days of incubation.

**Growth at 45°C.** The growth features at 45°C were examined on SDA plates by incubating for 72 hours. To minimize the possible effects that may arise from temperature variations, plates were preheated at 45°C for 30 minutes before subculture.

**Subculture on Staib agar.** All isolates were streaked on Staib agar (Guizotia abyssinica 50g, glucose 1g [Merck], KH<sub>2</sub>PO<sub>4</sub> 1g [Merck], agar 15g) to evaluate their colony morphology. Subcultures were incubated at 30°C for 48 hours, then at least 10 colonies for each isolate were evaluated visually and with colony microscope (Leica MZ6).

**DNA extraction.** The DNA for PCR was extracted by minor modifications of the protocol of Dassanayake et al.<sup>2</sup>

**PCR identification.** For the definite identification of *C.albicans* and *C.dubliniensis*, primers specific to *C.albicans* (NL4 and CAL5) and *C.dubliniensis* (DUBF and DUBR) and defined reaction conditions were used.<sup>3,4</sup>

All the isolated 60 Candida species were reevaluated for germ tube formation and all of them produced germ tube. All isolates produced chlamyospore on cornmeal agar as from the second day. Germ tube and chlamyospore forming 60 isolates were subcultured on SDA and incubated at 45°C for 72 hours. At the end of the incubation, only 2 isolates failed to grow at 45°C. Germ tube and chlamyospore forming 58 isolates and the 2 isolates likely to be *C.dubliniensis* were subcultured on Staib agar and incubated at 30°C for 48 hours to obtain their colony morphology. After the incubation, isolates were evaluated both visually and with colony microscope. All samples produced smooth colony on Staib agar. A PCR was applied to all 60 isolates for the definite diagnosis. All the isolates were identified as *C.albicans*, however, there were no *C.dubliniensis*.

Candidae are normally regarded as commensal organisms, but when certain pathological processes alter the balance between the host and the endogenous flora, they become opportunistic endogenous pathogens with the capacity to produce superficial and deep-seated infections. *Candida albicans* is by far the most frequent agent responsible for fungal infections; however, the emergence of non-*C.albicans* species, such as

*Candida parapsilosis*, *Candida krusei* and *Candida tropicalis*, has also been observed. The recent emergence of *C.dubliniensis* as an opportunistic pathogen appears to coincide with this apparent epidemiological shift.<sup>5</sup> Although the majority of the *C.dubliniensis* isolates have been recovered from the oral cavities of HIV-infected patients, this fungal organism has also been isolated from specimens from different body sites.<sup>6</sup> In our study, our aim was to determine the prevalence of *C.dubliniensis* among patients with respiratory tract infections but without HIV-infection or AIDS, so, patients hospitalized in various clinics due to respiratory tract infections composed the study group and we examined the 60 germ tube positive isolates that were isolated as the infectious factor from the sputum samples of these patients.

There are few studies in the literature reporting the *C.dubliniensis* rate in the respiratory tract samples of HIV-negative patients. Fotedar et al<sup>7</sup> reported 7 *C.dubliniensis* in their study on 75 germ tube positive respiratory samples of sputum, bronchoalveolar aspirate, and nasopharyngeal aspirate by using the phenotypic methods. In a study of Kantarcioğlu et al<sup>8</sup> among an immunocompromised HIV-negative Turkish patient population, *C.dubliniensis* was isolated in the oral cavity and sputum of a patient with acute myeloid leukemia at 2 month intervals. Petroche-Liacsahuanga et al<sup>9</sup> reported the 11.1% (6/54) rate of *C.dubliniensis* in the sputum samples of 54 patients with cystic fibrosis. In our study, we did not encounter *C.dubliniensis* among the 60 germ tube positive *Candida* species isolated from the sputum samples by using phenotypic and genotypic methods, however, more frequent recognition in the cystic fibrosis patient population and ability of producing fluconazole resistance features of the yeast necessitates extensive studies in particular patient populations and their samples in different geographic locates.

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## References

- Sullivan DJ, Moran GP, Pinjon E, Al-Mossaid A, Stokes C, Vaughan C, et al. Comparison of the epidemiology, drug resistance mechanisms and virulence of *Candida dubliniensis* and *Candida albicans*. *FEMS Yeast Res* 2004; 4: 369-376.
- Dassanayake RS, Ellepola ANB, Samaranyake YH, Samaranyake LP. Molecular heterogeneity of fluconazole-resistant and susceptible oral *Candida albicans* isolates within a single geographic locale. *APMIS* 2002; 110: 315-324.
- Mannarelli BM, Kurtzman CP. Rapid identification of *Candida albicans* and other human pathogenic yeasts by using short oligonucleotides in a PCR. *J Clin Microbiol* 1998; 36: 1634-1641.
- Donnelly SM, Sullivan DJ, Shanley DB, Coleman DC. Phylogenetic analysis and rapid identification of *Candida dubliniensis* based on analysis of ACT1 intron and exon sequences. *Microbiology* 1999; 145: 1871-1882.
- Sullivan D, Coleman D. *Candida dubliniensis*: Characteristics and identification. *J Clin Microbiol* 1998; 36: 329-334.
- Jabra-Rizk MA, Falkler WA, Merz WG, Baqul AAMA, Kelley JI, Meiller TF. Retrospective identification and characterization of *Candida dubliniensis* isolates among *Candida albicans* clinical laboratory isolates from Human Immunodeficiency Virus (HIV)-infected and Non-HIV-infected individuals. *J Clin Microbiol* 2000; 38: 2423-2426.
- Fotedar R, Al Hedaity SSA. Prevalence of *Candida dubliniensis* among germ tube-positive yeasts recovered from the respiratory specimens in HIV-negative patients. *Mycoses* 2004; 47: 150-155.
- Kantarcioğlu AS, Yücel A. The presence of fluconazole-resistant *Candida dubliniensis* strains among *Candida albicans* isolates from immunocompromised or otherwise debilitated HIV-negative Turkish patients. *Rev Iberoam Micol* 2002; 19:44-48
- Petroche-Liacsahuanga H, Dohmen H, Haase G. Recovery of *Candida dubliniensis* from sputum of cystic fibrosis patients. *Mycoses* 2002; 45: 15-18.

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Noninvasive ventilation in mild to moderate cases of respiratory failure due to acute exacerbation of chronic obstructive pulmonary disease

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Exacerbations of respiratory symptoms requiring medical intervention are important clinical events in chronic obstructive pulmonary disease (COPD), and are the major causes of morbidity and mortality. A severe exacerbation may lead to worsening of the clinical status, blood gas parameters and inspiratory muscle dysfunction which may lead to acute respiratory failure. A major clinical problem in acute on chronic hypercapnic respiratory failure is the inability to adequately oxygenate without worsening the hypercapnia, and therefore incurring the need to support ventilation. Over the last 15 years, noninvasive positive pressure ventilation has been used in this group of patients with variable success rates. Most studies compared