Main topic
Necrotizing enterocolitis. Results of surgery

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Abstract. From 1975 to 1991, 132 patients with necrotizing enterocolitis (NEC) were treated at the Department of Pediatric Surgery in Graz. Two of 49 conservatively treated patients died (4%), 1 of these was not operated upon due to complex additional malformations, and the other, a baby with 860 g birth weight (BW), could not be resuscitated successfully. Eighty-three patients were treated operatively, 78% with intestinal resection and exteriorization of the bowel. The mean gestational age (GA) was 36 weeks, the mean BW 2,400 g. Nearly all the patients had a medical history of one or more of the well-known predisposing risk factors; 65% had an intestinal perforation at laparotomy, 25% a transmural intestinal necrosis, and 10% pneumatosis or hemorrhagic inflammation of the intestine. Overall mortality in operated patients was 21.7% (n = 18), including 4 deaths in patients with total intestinal necrosis. There were 12 operative deaths, mainly due to progressive septicemia or total intestinal necrosis, and 6 late deaths due to infection, congenital heart disease, or cerebral disease. The mortality declined from 34% before 1985 to 7.7% after 1985 and 6.3% in the last 5 years of this study. Thirty operative complications consisted chiefly of late stenoses, ileus, or late anastomotic complications. Among these patients, only 1 with septicemia after ileostomy closure died. In contrast, all major nonoperative complications caused death, primarily due to infectious problems with septicemia. Mature granulocytes at admission were significantly higher among operated survivors (42.9% vs 23.0%) and represented a valuable predictor of patient survival. In conclusion, despite some differences in this population group with respect to the literature (higher GA and BW), the results show a definite increase in survival, reaching more than 90% of operated patients with NEC.

Key words: Necrotizing enterocolitis – Complications – Operative treatment – Mortality

Introduction
Necrotizing enterocolitis (NEC) has been a challenge for pediatric surgeons since the time it emerged parallel with progress in perinatal and neonatal care. Today, NEC is the most common acquired life-threatening intestinal disease in the neonatal age group. Although the pathogenesis of NEC is not yet fully understood, the pediatric surgeon is faced with an infectious disease of the small and/or large bowel characterized by mucosal defects, transmural necrosis, gangrene, and single or multiple perforations. A variety of methods have been developed for clinical staging (e.g., Bell’s classification) and early diagnosis of intestinal gangrene (e.g., paracentesis) in order to allow optimal assignment of a given patient to the appropriate conservative or operative therapy [4, 14, 19]. Mortality is higher in patients where disease and/or intestinal perforations are more advanced. Literary sources indicate that in the 1970s the mortality was at one time as much as 70% for operated patients [20, 24]. These figures have improved dramatically over the past 10 years, primarily as a consequence of progress in intensive care medicine, powerful antibiotic therapy, and appropriate respiratory support. In our institution, mortality rates of operated patients with NEC declined from 46.7% before 1985 to 12.5% after 1985. Over the past 5 years, from 1987 to 1991, we lost 2 of 54 newborn babies with NEC (3.7%) or 6.3% of the operated newborns. This article presents a retrospective analysis of the results of operative treatment of patients with NEC from 1975 to 1991.

Patients and methods
A total of 132 patients with NEC (77 male, 55 female) were admitted to our institution between 1975 and 1991 (Fig. 1). The mean gestational age (GA) was 36.0 ± 0.3 weeks, the mean birth weight (BW) 2,350 ± 74.7 g (Fig. 2). The age at admission (AA) was 7.4 ± 0.7 days. GA and AA correlated negatively (r = -0.48) (Fig. 3). The first feeding started on average after 1.7 days and the first symptoms of NEC were observed 6.7 days after birth. Forty-nine patients (37.1%) were treated conservatively, while 83 (62.9%) required operative treatment. All patients were...

Fig. 2. Distribution of gestational age GA, above and birth weight (BW, below) shows an unusually high number of mature patients.