

gery has been the traditional treatment of fenestrated duodenal membranes. A radial endoluminal incision of the membrane can widen its diameter and resolve the duodenal obstruction.

**OBJECTIVE:** We describe a new endoscopic procedure for membranectomy of fenestrated duodenal membranes.

**METHODS:** Under general anesthesia and endotracheal intubation, we introduced a flexible videopanendoscope into the second duodenal portion to visualize the membrane. Through the fenestration, we inserted a triple-lumen stone extraction balloon of 15 mm. After insufflation, we performed gentle traction to expose the membrane and distinguish its border from the duodenal wall. We dilated the orifice and advanced the endoscope to localize Vater's ampoule. Using a sphincterotome, we performed 1 or 2 radial cuts of 1.5 to 2.0 cm in the membrane in an opposite direction to the ampoule.

**RESULTS:** We performed this procedure on 10 patients. The mean duration of the procedure was 50 minutes. No patient had postoperative pain. Abdominal condition was normal, and all patients started oral intake 18 to 24 hours after the endoscopy. Patients were discharged asymptomatic. They completed 4 months to 4 years of follow-up. Eight continued to be asymptomatic. One had a double duodenal membrane and after 2 endoscopic cuts has occasional vomiting. Another 1 was lost to follow-up.

**CONCLUSIONS:** Transluminal endoscopic treatment of fenestrated duodenal membranes has been a safe procedure that may be an effective and less invasive alternative to open or laparoscopic surgery.

## **PYLORIC STENOSIS: A RETROSPECTIVE STUDY OF AN AUSTRALIAN POPULATION**

**Submitted by Lisa Gotley**

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**INTRODUCTION:** Infantile hypertrophic pyloric stenosis (IHPS) is a common cause of nonbilious vomiting in infants. The "classic" presentation is one of a firstborn boy who is aged 2 to 8 weeks and has projectile vomiting; palpable olive, visible peristalsis; and hypochloremic metabolic alkalosis. With increased awareness of the condition and readily available ultrasonographic diagnosis, classic presentations may be becoming less common.

**OBJECTIVE:** We sought to describe the epidemiology, clinical features, and outcomes of children with IHPS at our institution.

**METHODS:** We conducted a retrospective case review of all cases of IHPS that presented to our tertiary pediatric hospital in an 11-year period.

**RESULTS:** The inclusion criteria were met by 330 children with confirmed IHPS. A total of 84% of patients were male, and 19% were born preterm. Preterm infants tend to present later, reflecting postmenstrual age. The median age at presentation was 36 days (range: 7–218 days) with mean symptom duration of 11 days (range: 1–95 days). Whereas 87% of patients had at least 1 classic finding on history or examination, only 14% had the classic triad. Elevated bicarbonate was present in 61% of blood samples, whereas hypochloremia was found in only 29%. Ultrasound confirmed the diagnosis in 89%. Surgical techniques were similar in outcome, except that incomplete pyloromyotomy was more common with the laparoscopic approach compared with the periumbilical approach (6% vs 1%).

**CONCLUSIONS:** IHPS occurs more frequently in boys and infants who were born preterm. It commonly presents without the full spectrum of classic findings. Given the availability of ultrasound diagnosis, IHPS should be considered in infants with any 1 of these findings.

## **LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN: A 5-YEAR EXPERIENCE**

**Submitted by Evangelos Papandreou**

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**INTRODUCTION:** Cholecystectomy in children is not a common surgical procedure. In the past 5 years, we have performed it laparoscopically. There was no difference in insufflated pressure between 2 groups while no drainage catheter was placed.

**OBJECTIVE:** We present a modified laparoscopic technique in children.

**METHODS:** In a 5-year period, 54 children underwent laparoscopic cholecystectomy. Their ages ranged from 14 months to 15 years (mean: 7.6 years). Depending on the applied technique, the patients were separated into 2 groups. The first group comprised 17 patients on whom we performed the conventional 4-port technique. The second group comprised 37 patients on whom a modified technique was performed. We used 3 ports: an umbilical port for the camera, another in the subxifoid region for the dissector, and a third in the right lower quadrant for the grasping clamp and the extraction of the gallbladder. Vessel sealing electrocautery was used

for ligation of the cystic artery and detachment of the gallbladder.

**RESULTS:** Reduction of the number of ports had no effect on accessibility and duration of the procedure; however, it simplified access and handling, particularly in the smaller patients. Conversion to open cholecystectomy was performed in 1 case with major deformities of the vertebral column. The duration of hospitalization varied from 1 to 4 days (mean: 2.7 days).

**CONCLUSIONS:** The decreased number of ports and the use of vessel sealing electrocautery make laparoscopic cholecystectomy in children easier and safe, without affecting the perioperative time.

## PROCALCITONIN AS A PREDICTOR OF SEVERE APPENDICITIS IN CHILDREN

### Submitted by Ioanna Velissariou

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**INTRODUCTION:** Procalcitonin is an amino acid peptide that can contribute in the diagnosis and management of severe bacterial infections because it reaches high concentrations in patients with severe bacterial infection, septicemia, or meningitis and decreases rapidly after appropriate antibiotic therapy.

**OBJECTIVE:** The objective of this study was to assess the diagnostic value of procalcitonin in 212 children with appendicitis and compare it with the standard diagnostic modalities, C-reactive protein, white blood cell count, and abdominal ultrasonography, in relation to the surgical and histologic findings of the appendix.

**METHODS:** Prolactin levels were measured in 212 children with appendicitis, and the results were compared with standard diagnostic modalities such as C-reactive protein level, white blood cell count, and abdominal ultrasonography, which are useful aids for detecting severe appendicitis and/or perforation.

**RESULTS:** A procalcitonin value of >0.5 ng/mL was indicative of perforation or gangrene with 73.4% sensitivity and 94.6% specificity, C-reactive protein level of >50 mg/L and white blood cell count of >10<sup>4</sup>/μL are useful diagnostic aids for perforation, and abdominal ultrasonography had a sensitivity of 82.8% and a specificity of 91.2%.

**CONCLUSIONS:** Procalcitonin seems to be a useful adjunct diagnostic tool for acute necrotizing appendicitis or perforation, and surgical exploration will probably be required in patients with procalcitonin values of >0.5 ng/mL.

## Vaccination

### IMMUNOGENICITY AND SAFETY OF CONCOMITANT ADMINISTRATION OF MEASLES-MUMPS-RUBELLA VACCINE AND VARICELLA VACCINE BY THE INTRAMUSCULAR OR SUBCUTANEOUS ROUTE

#### Submitted by Yves Gillet

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**INTRODUCTION:** In Europe, recommended administration route for vaccines and physicians' preferences vary.

**OBJECTIVE:** The aim of this study was to compare the immunogenicity and safety profile (injection-site and systemic adverse events) of a measles-mumps-rubella vaccine (M-M-RvaxPRO) and a varicella vaccine (Varivax) when given by intramuscular or subcutaneous route.

**METHODS:** A total of 752 healthy children who were 12 to 18 months of age were randomly assigned to receive concomitantly at 2 separate injection sites 1 dose of both vaccines by the same route, either intramuscular or subcutaneous.

**RESULTS:** Six weeks after vaccination, response rates in patients who were initially seronegative were similar for all antigens (intramuscular noninferior to subcutaneous), and geometric mean titers were comparable irrespective of the administration route (Table 1). Similar numbers and types of systemic adverse events were observed in both groups, excepted for varicella/varicella-like rashes, which were less frequent in the intramuscular group. Injection-site reactions were also less frequent for both vaccines in the intramuscular group compared with the subcutaneous group (15.8% and 25.8% of patients for M-M-RvaxPRO and 20.9% and 34.3% for Varivax, respectively), but the safety pattern was comparable between groups.

TABLE 1. Response Rates and Geometric Mean Titers of the Measles-Mumps-Rubella and Varicella Vaccines When Given by Different Routes

Per-Protocol Analysis	Intramuscular			Subcutaneous		
	n	Relative Risk, %	GMTs	n	Relative Risk, %	GMTs
Measles, ≥255 mIU/mL	349	94.3	2396.4	363	96.1	2560.6
Mumps, ≥10 ELISA Ab U/mL	349	97.7	86.4	363	98.1	89.8
Rubella, ≥10 IU/mL	321	98.1	97.2	318	98.1	94.4
Varicella						
≥5 gpELISA U/mL	336	88.4	9.8	345	85.5	9.2
≥1.25 gpELISA U/mL	336	98.5	9.8	345	99.4	9.2

**CONCLUSIONS:** These results support both intramuscular and subcutaneous administration routes for M-M-RvaxPRO and Varivax.

## LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN: A 5-YEAR EXPERIENCE

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