in patients with duodenal ulcer;[3] a higher incidence of arches was observed in patients with constipation and abdominal pain[4] and chronic intestinal pseudoobstruction.[5] Our findings suggest that dermatoglyphics may have a role in the investigation of gallstone diseases.

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References

1. Cummins H, Midlo C. *Finger prints, palms and soles. In:* An Introduction to Dermatoglyphics. New York: Dover Publication, 1961; pp 71, 210-34.
2. Holt SB. *The Genetics of Dermal Ridges.* Springfield: CC Thomas, 1968; pp 59-64.
3. Chauhan DP, Singh K, Nair CR, Mehta SK. Dermatoglyphic studies in patients with chronic duodenal ulcer. *IRCS Med Sci* 1985; 13: 174-5.
4. Gottlieb SH, Schuster MM. Dermatoglyphic fingerprint. Evidence for a congenital syndrome of early onset constipation and abdominal pain. *Gastroenterology* 1986; 91: 428-32.
5. Pulliam TJ, Schuster MM. Congenital markers for chronic intestinal pseudoobstruction. *Am J Gastroenterol* 1995; 90: 922-6.

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Number of breath samples required for detection of lactose intolerance by lactose hydrogen breath test

The hydrogen breath test (HBT) is a sensitive, specific and noninvasive test for the diagnosis of incomplete carbohydrate digestion and absorption[1]. Although the original procedure involved confinement of patients in a continuous collection-rebreathing system,[2] modern procedures generally involve interval sampling of breath H_2 after a carbohydrate load.[3] There is no consensus on the frequency and duration of collection of breath samples. Therefore, this prospective study was conducted in an attempt to determine the ideal number of breath samples required for the detection of lactose intolerance by the lactose HBT.

The study was conducted on 375 patients [197 men, 178 women; aged 16-75 years, mean (SD) 45 (9.5)] suspected to have lactose intolerance on clinical grounds. Each patient was given 50 g lactose, and the HBT was performed by the standard method.[4] Patients showing high fasting value and early peak (suggestive of bacterial overgrowth) were excluded from analysis.

Two hundred and thirty six patients (62.9%) had abnormal HBT (>20 ppm rise in H_2 over fasting value). Analysis of fasting breath H_2 samples and an additional sample at $^1/_2$ h, 1 h, $1^1/_2$ h, 2 h, $2^1/_2$ h, 3 h, $3^1/_2$ h and 4 h detected abnormality in 7.2%, 39.4%, 60.2%, 83.5%, 86%, 88.9%, 88.6% and 85.2% of patients, respectively. When the results of the tests at fasting and from 2 h to 4 h were pooled, all the abnormal cases were detected; no other combination of readings gave such an outcome.

An uncomfortable feature of the lactose HBT has been the need for analysis of a large number of samples. Abramowitz *et al*[5] showed that estimation of breath H_2 in fasting samples and at 2 h picked up all abnormal cases; estimation at only 2 h gave a positivity rate of 94.8%. These results were not reproducible.

Our results suggest that for the diagnosis of lactose malabsorption, breath H_2 samples should be estimated at fasting and at $^1/_2$ hourly intervals between 2 h and 4 h.

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References

1. King GE, Toskes PP. The use of breath test in the study of malabsorption. *Clin Gastroenterol* 1983; 12: 591-610.
2. Levit MD, Engel RR. Intestinal gas. *Adv Intern Med* 1975; 20: 151-65.
3. Solomons NW, Rosenberg IH, Viteri F. Development of an interval sampling hydrogen (H_2) breath test for carbohydrate (CHO) malabsorption in children. Evidence for a circadian pattern of breath H_2 concentration. *Pediatr Res* 1978; 12: 816-23.
4. Newcomer AD, McGill DB, Thomas RJ, Hoffman AF. Prospective comparison of indirect methods for detecting lactase deficiency. *N Engl J Med* 1975; 293: 1232-6.
5. Abramowitz A, Granot E, Tamir I, Deckelhaun RJ. Two hours lactose breath hydrogen test. *J Ped Gastroent Nutr* 1986; 5: 130-3.

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Comparative evaluation of serology and polymerase chain reaction for hepatitis C viral infection in liver diseases

The diagnosis of hepatitis C virus (HCV) infection in acute and chronic liver diseases rests on the detection of the viral genome by polymerase chain reaction (PCR) and/or detection of specific antibodies by ELISA. We compared the results of these methods.

The study group consisted of 212 patients with acute viral hepatitis (AVH; n=71), fulminant hepatic failure (FHF; 42), subacute hepatic failure (SAHF; 10), chronic active hepatitis (CAH; 17), cirrhosis of liver (62) or hepatocellular carcinoma (HCC; 10). Hepatitis A virus (HAV) infection was diagnosed by detection of IgM anti-HAV antibodies in 11 patients (15.2%) with AVH and 22 (4.7%) with FHF. Hepatitis B was diagnosed by detection of HBsAg

Table: Results of ELISA and PCR in various liver diseases

Disease group	No. of patients	NANB	Anti-HCV (ELISA)	HCV RNA (PCR)
AVH	71	42	3	7
FHF	42	18	1	2
SAHF	10	4	0	2
CAH	17	8	2	4
Cirrhosis	62	44	18	20
HCC	10	6	0	2

NANB = non A, non B

and/or IgM anti-HBc antibody in 18 patients (25%) with AVH, 22 (52.3%) with FHF, 6 with SAHF, 9 with CAH, 20 (31.2%) with cirrhosis and 4 with HCC. Sera samples which tested negative for the above markers were tested for HCV by a second-generation ELISA test (Pinnacle Biosystem, USA) and HCV RNA by PCR (Table). PCR was more frequently positive than ELISA.

Newer antibody tests, including third-generation ELISA and RIBA tests,[1,2] particle agglutination tests,[3] and IgM anti-HCV test[4] are quite sensitive and specific and can diagnose HCV infection early. The RIBA-2 test can detect anti-HCV antibody at 11 weeks and always within 20 weeks from the onset of infection.[5] But this is too long a period for a patient with FHF.

HCV is a more important etiologic agent in chronic liver diseases, and in these patients anti-HCV detection by ELISA may be used as a routine diagnostic modality.

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References

1. Weiland O, Schvarcz R. Hepatitis C: virology, epidemiology, clinical course and treatment. *Scand J Gastroenterol* 1992; 27: 337-42.
2. Claeys H, Volkaerts A, Verhaert H, De Beenhower H, Vermylen C. Evaluation of anti HCV capsid in indeterminate serum samples. *Lancet* 1992; 340: 249.
3. Nakagiri I, Ichihara K, Ohmoto K, Hirokawa M, Matsuda N. Analysis of discordant test results among five second-generation assays of anti hepatitis C virus antibodies also tested by polymerase chain reaction RNA assay and other laboratory and clinical tests for hepatitis. *J Clin Microbiol* 1993; 31: 2974-80.
4. Quiroga JA, Campillo ML, Catillo I, Bartolome J, Poues JC, Carreno V. IgM antibody to HCV in acute and chronic hepatitis C. *Hepatology* 1991; 14: 38-43.
5. De Casto M, Sanchez J, Herrers JF, *et al.* Hepatitis C virus antibodies and liver disease in patients with porphyria cutanea tarda. *Hepatology* 1993; 17: 551-7.

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Improvisation of indigenous pneumatic dilator

We had reported earlier the use of an indigenous pneumatic dilator developed by us.[1] We have now incorporated certain modifications:

1. A single condom is as effective as the three condoms used earlier as balloon; this avoids the possibility of puncture of the two inner condoms and entrapment of air in the outer condom, thereby preventing deflation of the dilator after the procedure.

2. The tied ends of the silk cloth are covered with pieces of latex tubing; this protects the thread from getting wet during the procedure and later while washing the dilator, and rules out the possibility of loosening of the thread.

3. The lumen of the Levin's tube is blocked with a metal ball and cyanoacrylate glue, which is more effective than other adhesives.

4. The center of the dilator is marked with a black cloth ring; this helps in positioning the dilator at the gastroesophageal junction during dilatation under endoscopic guidance.

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References

1. Nijhawan S, Rai RR. Pneumatic dilatation of achalasia cardia with indigenous pneumatic dilator. *Indian J Gastroenterol* 1995; 14: 17-8.

Partington's pancreaticojejunostomy does not need modification

Bapat *et al*[1] have described a modification of the Partington-Rochelle modification of the Puestow-Gillesby procedure, where they have anastomosed the jejunum side-to-back to the pancreas, rather than the conventional side-to-side method. They claim that this "avoids closure of the jejunal end, a potential site of leak if there is distal obstruction," and that the fish-mouthing effect created better drainage.

I am not, however, aware that leakage from the terminal stump of the jejunum is indeed a frequent complication. In our series of over 160 pancreaticojejunostomy operations, we have never encountered this problem. The authors failed to show in their literature review that this is a serious problem which needs correction. Should distal obstruction occur, the pancreatic anastomosis would disrupt long before the jejunal suture line. If, on the other hand, the stump were to give way first, it would be a blessing as it might be easier to correct.

The authors have also concluded that the modification provides a "dependent, wide, funnel-shaped, Roux-en-Y anastomosis" and therefore it is superior. It is rather presumptive that an end-to-back anastomosis would allow