increasing dysuria and discomfort and was passing debris. Various organisms including 
Proteus mirabilis, Candida albicans, Escherichia coli, and Pseudomonas aeruginosa were 
isolated on different occasions and he received a variety of antibiotics including 
augmentin, nalidixic acid, and gentamicin. He was finally admitted in November 1985 as an 
emergency with severe pain. Cystotomy was undertaken and a free-floating mass 
removed from his bladder. Unfortunately, he made a poor recovery and died two days 
later; permission for necropsy was refused.

The surgical specimen comprised a mass 110 x 70 x 40 mm which was generally 
pale brown but with some friable white material on the surface. On sectioning, it was 
found to consist of concentric layers of soft, slightly gritty material (fig 2), the appear-
ances being very similar to that of a cut onion.

Haematoxylin and eosin stained sections showed the mass to consist of layers of amorphous 
material, which stained positively with alcian blue and periodic acid Schiff. Occasional areas showed fibrin depositions with MSB stain. Gram positive cocci and yeast-like fungi showing profuse mycelial growth and spore formation in 
keeping with Candida species were present particularly near the surface.

X-ray microanalysis was performed on samples from three areas; this showed the 
main mineral constituents to be phosphate and calcium which occurred in variable 
proportions.

Comment
There is scant mention of this entity. In 1961 Chisholm and Hut4 reported two cases of 
fungus ball formation in the bladder, having clinical and morphological features similar to 
our own case. These were described as being laminated amorphous masses up to 100 mm in diameter. Histological examination showed mycelia and spore forms morphologically consistent with Candida. Both cases described prior to this as "fibrin stone," "fibrinoma," "albumin stone," "bacterial stone," and "sarcoidopseudolith" represent the same 
entity. The variety of terms used reflects the lack of understanding regarding the nature 
and pathogenesis of this entity.

Fungus balls are difficult to diagnose, and should be suspected clinically when an 
apparent stone is seen at cystoscopy which is not shown by X-ray picture, particularly in 
the presence of appropriate aetiological factors such as long term infection and obstruction, diabetes mellitus, neurogenic bladder or previous surgery. Treatment of this condition is unsatisfactory as these masses tend to recur and cystotomy in the age group affected carries a risk of morbidly. Repeated

Letters to the Editor
washouts with Noxyflex in our case seemed to be of little benefit. In fact, despite this, the 
mass increased in size between the original cystoscopy and cystotomy five months later.

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Effect of oral microflora on interpreting hydrogen breath test

The technique of exhaled breath hydrogen monitoring is non-invasive, simple, and inex-
ensive. It has major advantages over traditional methods for the investigation of 
suspected small bowel bacterial overgrowth, small bowel transit time, or carbohydrate 
tolerance. The quality of information provided by the technique may be adversely 
fluenced by extra-intestinal factors, some of which may seriously impair the validity of 
test interpretation.

A transient rise in exhaled breath hydrogen has been reported to occur soon after carbohydrate ingestion. The mechanism of this early post-prandial breath hydrogen peak has been recently studied and thought to be due to fermentation of the ingested carbohydrate by anaerobic microflora which are harboured in the mouth and oropharynx. We have attempted to study this hypothesis.

Breath hydrogen concentrations were determined by collecting 20 ml aliquots of the end expiratory volume. The hydrogen concentrations (in parts per million) was measured by means of an electrochemical breath analyser (GMI Medical Ltd, Scotland) which was calibrated using samples of room air (undetectable hydrogen), and a standard gas mixture containing 96 ppm of hydrogen.

Twenty five healthy hospital staff were tested (13 men and 12 women), their ages 
ranging from 17 to 61 years with a mean of 35. After an overnight fast they were asked to
Breath hydrogen concentration (ppm) before (A) and after (B) chlorhexidine mouthwash.

Figure

brush their teeth and not to smoke for the duration of the test. A measurement of breath hydrogen was then made. They then rinsed their mouths with 20 ml of a 1% lactulose solution for one minute without swallowing it. A further 15 breath hydrogen measurements were made at two minute intervals. The test was then repeated the next day. On one of the two consecutive days the subjects rinsed their mouths with a 1% chlorhexidine solution for one minute before rinsing their mouths with the lactulose solution. Thirteen of the subjects had the chlorhexidine mouthwash on the first day and the other 12 had the mouthwash on the second day.

Multivariate profile analysis was used to show that the mean breath hydrogen concentration profile was significantly (p < 0.05) higher in those who had not taken the chlorhexidine mouthwash (figure).

In both groups the time to maximum breath hydrogen concentration varied between two to 30 minutes after the lactulose mouthwash. The maximum mean increase over the fasting breath hydrogen was found to be 14.3 (SEM 4.7, 95% CI) ppm in the group not treated with chlorhexidine and 5.7 (SEM 1.9) ppm in the group treated with chlorhexidine. There was a highly significant difference between the two groups (Student's t test = 3.50 for 48 df, p = 0.0005).

In the group treated with chlorhexidine the maximum individual rise in breath hydrogen during the study was 17 ppm; without chlorhexidine the maximum rise was 52 ppm.

Our results confirm the presence of an early hydrogen peak after lactulose mouthwash. Moreover, an early breath hydrogen peak was still observed after oral hygiene with chlorhexidine mouthwash.

It has been proposed that a peak breath hydrogen concentration of 20 ppm before the colonic peak is indicative of small bowel bacterial colonisation. In our study the magnitude of individual results emphasises the possible effect of the early peak on the attempted diagnosis of small bowel bacterial colonisation. We suggest that for making this diagnosis oral hygiene with chlorhexidine is essential and that an increment of 20 ppm of breath hydrogen over the fasting value may be a minimum cut off point.

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Immune complexes in the choroid plexus in systemic hypertension

Immunomorphological investigations were applied to the study of the kidney in patients with systemic hypertension. Various investigators observed, by immunofluorescence microscopy, deposition of immunoglobulins (Ig) and fractions of the complement (C) system in small arteries arterioles, and renal glomeruli in cases of malignant systemic hypertension and, less commonly, in benign cases. The choroid plexus is a vascular and epithelial tissue which actively forms cerebrospinal fluid from blood by a process of filtration and secretion. Like the renal glomerulus, its vascular core is composed of capillaries with a fenestrated endothelium. In spite of the structural and functional similarities between the choroid plexus and the renal glomerulus, the existence of similar changes in the choroid plexus in systemic hypertension have not been studied.

We studied choroid plexus specimens obtained from 45 patients at necropsy in the department of pathology of the Federal University Minas Gerais Medical School, in Belo Horizonte. Twenty five of these patients had clinically and histologically diagnosed systemic hypertension (systemic hypertension group), 19 of which had the benign form and six the malignant form, whether preceded by the benign form or not. The remaining 20 patients had died from diseases with no evidence of renal or brain involvement by hypertension or other disease processes. The brain was removed from six to 12 hours after death, and the choroid plexus of the inferior horn of one of the lateral ventricles was taken, embedded in resin, frozen, and stored at −70°C until it was cut with a cryostat knife. Human Ig (IgA, IgG, IgM) and fractions of C (C3 and C4) were investigated by the routine direct immunofluorescence technique using monospecific fluoresceinated antisera (Miles Laboratories, Research Products Division, Indiana, USA).

Positive immunofluorescence in the choroid plexus was found in five of the 25 cases from the systemic hypertension group; four cases were associated with benign hypertension and one with malignant hypertension. IgG was more often found than Ig (five cases). C3 and IgA were also present (C3: four cases, IgA: three cases). All the five cases with positive immunofluorescence showed a granular pattern, sparsely distributed in the walls of a few villi of the choroid plexus (figure), resembling that usually seen in the kidney. Unfortunately, in this series we did not examine the immunohistology of the kidneys. Histological examination of the choroid plexus showed changes in 12 of the 25 cases from the systemic hypertension group; four of the five cases with positive immunofluorescence showed histopathological changes in the choroid plexus. The most commonly found change was characterised by focal, linear, occasionally nodular, subepithelial deposition of a homogeneous, acidophilic and periodic acid Schiff positive substance,
Effect of oral microflora on interpreting hydrogen breath test.

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