

# Measurement of small-bowel polyp size in patients with Peutz-Jeghers syndrome by using reference granules during video capsule endoscopy

# UCTN

In patients with Peutz-Jeghers syndrome, capsule endoscopy is a promising method of surveillance to detect the larger polyps that are most relevant clinically [1,2]. However, to our knowledge there is no formal method of judging polyp size accurately during capsule endoscopy [3]. Inaccurate assessment of polyp sizes has important implications for management [4].

To increase the accuracy of polyp size assessment in patients with Peutz-Jeghers syndrome, we devised a polyp-diameter-measuring method by using reference size granules during video capsule endoscopy. Patients with Peutz-Jeghers syndrome who were undergoing capsule endoscopy ingested one sachet of Salofalk® Granu-Stix® 5 minutes before swallowing the video capsule. Each sachet contained 600 granules, each with a diameter of 1 mm (Figure 1).

Both video capsule and granules were propelled close to each other by small bowel peristalsis. In most of the images, therefore, granules were seen and could be used as a reference size device. Granules dissolved in the distal part of the ileum, and they did not disturb the quality of images.

We used a simple mathematical equation to avoid inaccuracy in measuring actual sizes, which may result from the difficulty in judging the distance of both the polyps and reference size granules from the capsule. First we measured, one by one, the diameter of 80–100 granules seen on the video images, and the mean apparent granule size was calculated ( $G_a$ ). Then we calculated the real polyp sizes ( $P_r$ ) by using the apparent polyp diameters ( $P_a$ ) measured on the image screen:  $P_r = P_a/G_a$ .

Using this mathematical model of continual approaches, one can calculate the real size of any polyp independently, whether or not the polyp is seen together with granules on the same image (Figure 2).

We tested our method successfully in three patients with Peutz-Jeghers syn-



Figure 1 Reference size granules each with 1 mm diameter.

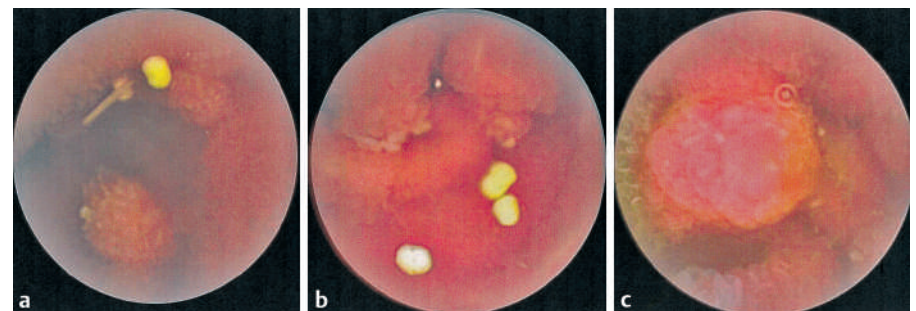


Figure 2 Jejunal polyps observed in patient with Peutz-Jeghers polyposis. Reference size granules are close to the polyps (a, b). The calculated polyp sizes are 2.4 and 4.3 mm (a), and 3.8 and 4.4 mm (b), and 6.5 mm (c) at the highest diameters.

drome. Polyp sizes of those removed by enteroscopy matched precisely the polyp sizes calculated by our method.

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