

How to Perform and Interpret Balloon Expulsion Test

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The balloon expulsion test is a simple and useful method for investigating a defecatory disorder assessing the subject's ability to evacuate a simulated stool. However, there is no standard methodology and varying interpretations have been reported. This review discusses the techniques, interpretation and clinical utility of the balloon expulsion test.

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Key Words

Constipation; Defecation; Functional gastrointestinal disorders

Introduction

The balloon expulsion test (BET) is a simple and inexpensive bedside procedure that can identify patients with pelvic floor dyssynergia. However, there is no standardization in the methodology such as the filling volume of the balloon or the position of the patient for BET.¹ In addition, the normal range of balloon expulsion time has differed in various studies and laboratories. This review discusses the techniques, interpretation and clinical utility of this examination.

How to Perform a Balloon Expulsion Test

The BET provides an assessment of the subject's ability to

evacuate artificial stool during simulated defecation within the laboratory environment (Figure).²⁻⁴ The examination can be conducted as part of anal manometry or as an isolated investigation.

Standard Procedure

Devices

Mostly, this simple test just requires a latex balloon attached to a catheter with a water-filled syringe to inflate the balloon.

Preparation

Patients are recommended to receive 1 or 2 cleansing enemas several hours before the procedure. Actually, rectal cleansing is not necessary for the examination itself. However, since patients usually worry about the occurrence of real defecation during the

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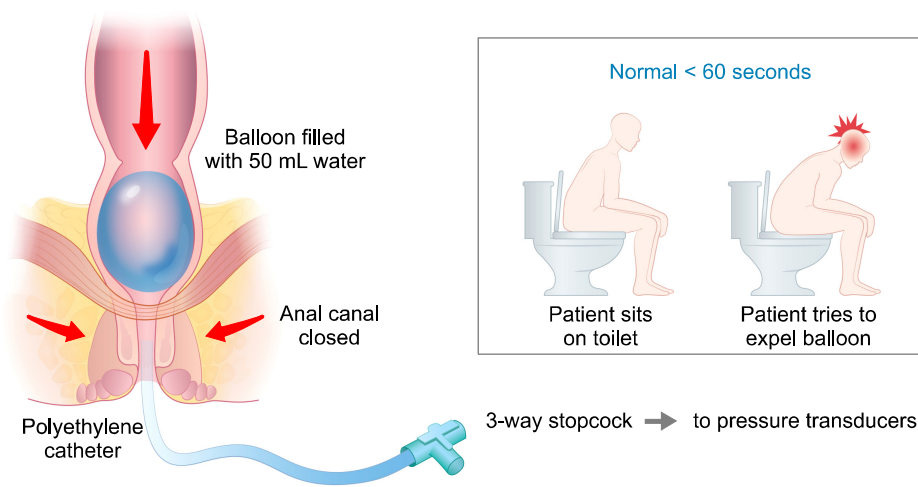


Figure. Balloon expulsion test. Adapted from Balloon expulsion test.⁴

test, performing rectal preparation is regarded to be more comfortable for patients.

Techniques

Patients are initially placed in a left lateral decubitus position with flexion of the knees and hips. After well lubricated empty balloon is gently inserted into the rectum, the balloon is inflated by a fixed volume, typically 50 mL of water, or alternatively until the patients feel a desire to defecate. Patients are then asked to attempt to evacuate the balloon in the sitting position in privacy.

Special Considerations

Types of the balloon and instilled material into the balloon

Since the methodology for BET has not been standardized as noted above, different types of balloon other than rubber balloon have been used including 18 mm spheres or silicone-filled stool-like device (FECOM). And some laboratories instill the balloon with the air instead of the water.¹

Filling volume of the balloon

In addition to rectal evacuation, perception of desire to defecate is essential for normal defecation, especially for the beginning and maintenance of defecation. While most laboratories inflate a rectal balloon by a standard volume, typically 50 mL, it has been reported that when rectal sensation is reduced, patients may not perceive the desire to defecate at a volume of 50 mL, limiting the ability to evacuate the balloon even though rectal evacuation is

preserved.⁵ That is, low volume insufficient to achieve a desire to defecate would result in overdiagnosis of a defecation disorder. Based on this observation, some recent studies suggested to inflate the balloon to the point at which the patients experience the desire to defecate.⁵ However, testers need to consider the possibility that it could be more difficult for patients with a defecatory disorder to expel a larger balloon.⁶ And these 2 techniques (i.e., fixed versus variable balloon inflation) have not been yet compared.

Meanwhile, one recent study recommended a FECOM with the result that stool-like sensation was more commonly evoked by FECOM than balloon.⁷

Position of the patient during defecation

In some laboratories, balloon evacuation is conducted in the left lateral decubitus position, wherein a rectal balloon is connected over a pulley to weights, which provides external traction when necessary to facilitate expulsion of rectal balloon.⁸ However, recent studies and laboratories suggested that sitting position appears to be more conducive for defecation than the lying position showing that 36% of normal healthy subjects exhibited a dyssynergic pattern in the lying position.⁷ Since sitting is an actual defecation posture and provides more driving force to defecate, it is desirable for patients to perform the balloon evacuation in the sitting position. And also, balloon evacuation should be done in a private setting. Because the test is fully conducted by patients' voluntary efforts, it is important to provide the patients with a relaxed and comfortable environment to obtain a correct result.

How to Interpret the Balloon Expulsion Time and Its Clinical Utility

Balloon expulsion time allowed for patients has differed according to the studies and laboratories. Since most normal subjects can expel the balloon within 1 minute, recent studies provide that inability to expel the balloon within 1 minute is suggestive of a defecatory disorder.^{2,9} Under the circumstances with left lateral decubitus position, normally, expulsion can be achieved spontaneously or with the addition of less than 100 g of weight.⁶

The prevalence of abnormal BET in favor of constipation varies between 23 and 67%.¹ One study reported a sensitivity of 88%, a specificity of 89%, a positive predictive value of 67% and a negative predictive value of 97% for this test and suggested a normal BET might exclude a defecatory disorder.⁵ However, Rao et al¹⁰ found that many patients with dyssynergia could expel the balloon and they described a contradictory view that a normal test could not exclude the possibility of a defecatory disorder.^{1,11} Around 0-16% of healthy controls had difficulty in evacuating the balloon¹ which means that the test itself was insufficient to make a diagnosis of a defecatory disorder.

Although the failure to expel a balloon strongly suggests the possibility of pelvic floor dyssynergia, a normal test does not exclude this possibility.¹ In addition, this simple test does not define the structural abnormality of anorectum and mechanisms of disordered defecation. Therefore, this test should be integrated along with other anorectal physiologic tests.

Some studies reported a capability of BET for predicting the outcomes in patients following biofeedback therapy¹²⁻¹⁴ and further studies are necessary regarding this issue.

Conclusions

The BET is a simple test widely used for diagnosing a defecatory disorder. Although the result of the test is binary (i.e., normal or abnormal), interpretation is not easy and should be done with caution. In conclusion, the BET is not a sole diagnostic test for a defecatory disorder, and must be used in conjunction with

other anorectal physiologic studies.

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