



# An imaginary cuboid: chest, abdomen, vertebral column and perineum, different parts of the same whole in the harmonic functioning of the pelvic floor

L. Brusciano<sup>1</sup> · C. Gambardella<sup>1,2</sup> · S. Tolone<sup>1</sup> · G. del Genio<sup>1</sup> · G. Terracciano<sup>1</sup> · G. Gualtieri<sup>1</sup> · M. Schiano di Visconte<sup>3</sup> · L. Docimo<sup>1</sup>

Received: 12 March 2019 / Accepted: 2 May 2019 / Published online: 7 May 2019  
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Dear Sir,

We have read with great interest the article “Pelvic floor rehabilitation for defecation disorders” by Bocchini et al. [1]. We congratulate the journal and the authors for the publication of a paper on the indications and modality of pelvic floor rehabilitation treatment in patients with defecation disorders. In the article, the authors suggest that the criteria for selecting patients for rehabilitative treatment are clinical, instrumental and behavioural. Among the clinical criteria, Bocchini and colleagues underlined the importance of evaluating patients’ eating habits, as well as their ability and willingness to cooperate. Moreover, the authors suggest using validated scores that give us useful information about clinical presentation of defecatory disorders. They also stressed the need to educate patients about a few simple and important concepts of pelvic anatomy and defecation physiology.

Our clinical experience is consistent with the conclusions of Bocchini et al. [1]. Nevertheless, we would like to address some relevant issues. Their method of evaluation, based solely on the function and integrity of the pelvic floor, might lead readers to underestimate the bigger picture, i.e. the comprehensive evaluation of chest, abdomen, vertebral column and perineum all considered as different parts of the same whole, all actively playing their role in patients with defecation disorders. In detail, pelvic floor contraction

and relaxation, for physiological defecation and urination, depends on the harmonic integration of what we can schematize as the four sides of an “imaginary cuboid” the diaphragm, the abdominal wall, the spine and the pelvic floor itself (Fig. 1).

It is clear that a patient who might benefit from rehabilitation cannot be only clinically and instrumentally assessed and we propose a psychiatric assessment, which allows us to identify, and then to correct, the alteration of several parameters modifying the harmony of the “imaginary cuboid” [2, 3]. The proctologist, gastroenterologist, urogynecologist, and all the specialists identified in the multidisciplinary team advocated in Bocchini’s article should be able to assess these parameters [4].

For example, the correct movement of the diaphragm has a decisive role in increasing intra-abdominal pressure [5]. In fact, it is well known that a fall in intra-abdominal pressure is directly connected to diaphragmatic and non-costal respiration. Therefore, we should be able to assess whether or not the patient knows how to recruit the diaphragm during the first clinical examination, and not when it is time to choose a suitable rehabilitation pathway. Regardless of the clinical presentation, the failure to recruit the diaphragm should be corrected through rehabilitation [2].

An important psychiatric consideration is the evaluation of lumbar hyperlordosis. It is well known that it can determine a variation of the distance between coccyx and pubis causing stretching or hypotonicity of the levator ani. Certainly, the central role of the abdominal cavity and the lower part of the pelvic floor in defecatory dynamics should not be neglected. The pelvic floor, in fact, seems to be currently the only side of the “cuboid” measurable by manometry.

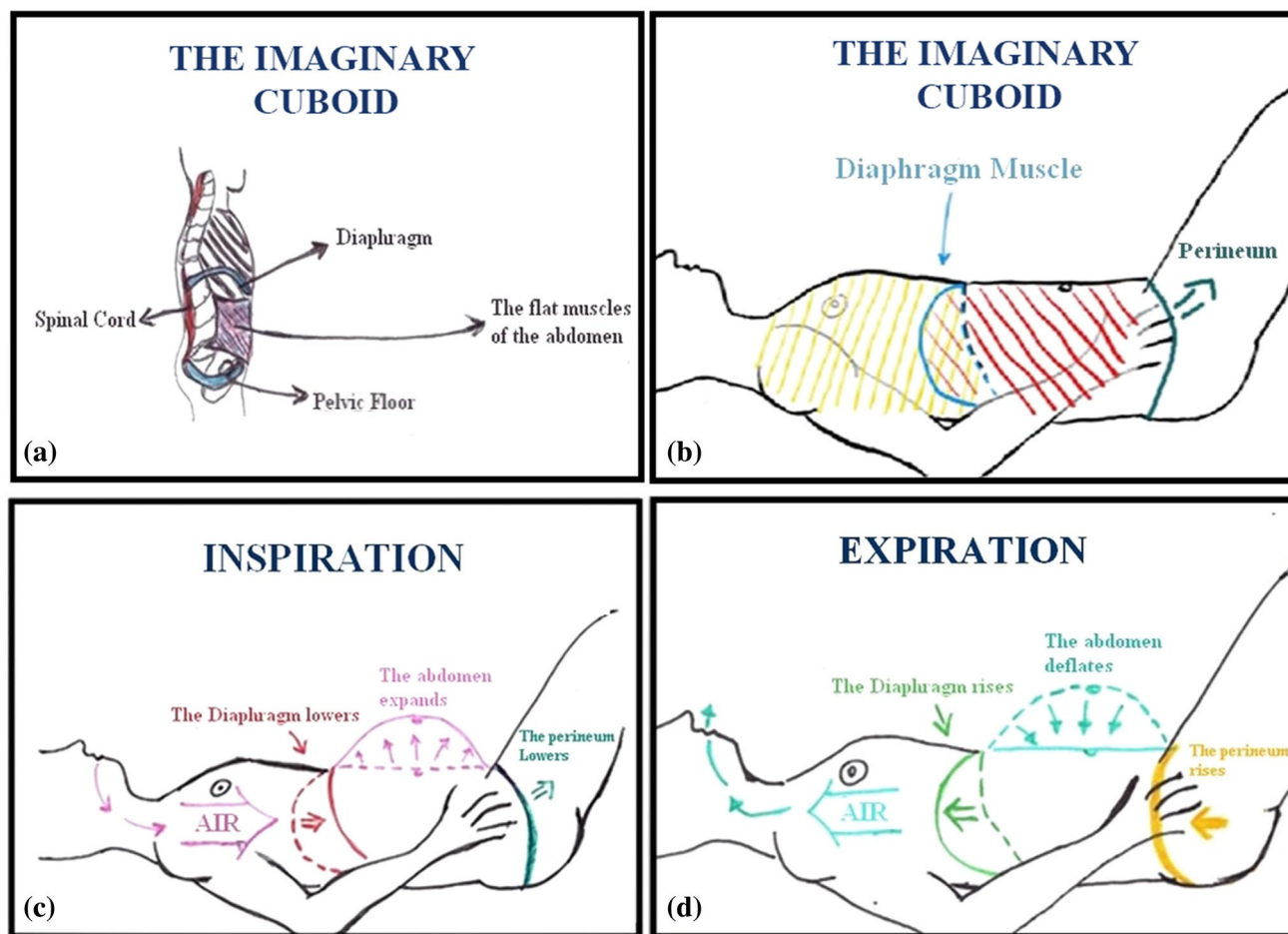
Clinical data collected and quantified using the scores mentioned by Bocchini et al. are important for patient evaluation, even if they play a minor role in identifying the indications for rehabilitation treatment. In fact,

✉ L. Brusciano  
luigi.brusciano@unicampania.it

<sup>1</sup> XI Division of General, Minimally Invasive and Obesity Surgery, University of Study of Campania “Luigi Vanvitelli” Naples, via Luigi Pansini n° 5, 80131 Naples, Italy

<sup>2</sup> Department of Cardiothoracic Sciences, School of Medicine, University of Campania “Luigi Vanvitelli”, Naples, Italy

<sup>3</sup> S. Maria dei Battuti Hospital, Conegliano, TV, Italy



**Fig. 1** a, b The “imaginary cuboid”. The diaphragm is the upper face, the pelvic floor is the lower one, the anterior face is represented by the flat muscles of the abdomen with the rectus muscle, the posterior face is represented by the spinal cord and the hips are the lateral

sides. During inspiration (c) and expiration (d), the cuboid undergoes several dynamic changes, involving all its components that influence intra-abdominal pressure and, therefore, pelvic floor function

rehabilitation should only be considered once all parameters altering the harmony of the “cuboid” have been identified, so that its function can be improved. Only after improvement of function can we assess whether there is also clinical benefit. For this purpose, we are currently validating a specific score, that we already adopted in our clinical practice, that could assess the presence of the correct and synchronic function of all the sides of the “imaginary cuboid”.

According to our clinical experience, and as admirably stated by Bocchini et al., any rehabilitative treatment should be preceded by re-educative treatment [1]. The re-education program should be based on four mandatory points:

1. Knowledge of anatomical–physiological notions of the pelvic floor and defecation;
2. Awareness of the role of correct breathing and of defecatory posture;

3. The importance of the perception of gastrocolic and gastroileal reflexes after an abundant meal without procrastinating the defecatory stimulus;
4. The great importance of the intake, in the right quantity and quality, of the constituent elements of the feces (water, fibres, lactic acid bacteria).

Our clinical experience leads us to emphasize the above points. An adequate re-educational process alone often results in relevant clinical improvement for the patient.

**Funding** None.

### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** This article does not contain any studies with human participants performed by the author.

**Informed consent** Informed consent is not applicable for this study.

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