

Importance of Morphometric Analysis of Inferior Epigastric Artery with Reference to Laparoscopic Portal

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Abstract

Introduction: Laparoscopy has been a choice of preference for various surgical procedures for more than two decades. Trocar and cannula are used to make required portals in the anterior abdominal wall for inserting laparoscope. Penetrating a pointed trocar is a blind method. Using the standard confirmed points for making portals, though secure, at times can lead to injury of blood vessels of anterior abdominal wall, mainly Inferior Epigastric Artery (IEA). Anatomical variations of IEA in origin, course, branching pattern and termination are well reported. Hence there is a necessity for mapping of IEA to avoid vessel injury.

Aim: The aim of present study is to map IEA in terms of its length from its origin, distances from midline extending from pubic symphysis to umbilicus and level of termination with relation to umbilicus.

Materials and Method: Study was conducted on 50 formalin embalmed adult cadavers by direct dissection method used for routine undergraduate teaching. IEA on both sides was dissected. Length, distance from midline with five reference points and termination with reference to umbilicus was recorded.

Results: Length of IEA - On right side it ranged from 7.2 - 25cms with mean 14.68 ± 4.78 , on left side from 8-24.3cms with mean 14.91 ± 3.55 .

Our study concluded safety zone $5.3\text{cm} \pm 1.92$ on either side of midline.

In our study 22% right IEA and 22% left IEA ended below the umbilicus.

Conclusion: The trocars can be safely inserted at $5.3\text{cms} \pm 1.92$ away from the midline on both the sides. However, preoperative mapping of IEA will help in minimizing vessel injury during laparoscopic procedures.

Keywords: Inferior Epigastric Artery; Length; Abdominal wall; Laparoscopy Injury; Portal; Safe Zone.

Introduction

Laparoscopy has been a choice of preference for various surgical procedures for more than two decades. Trocar and cannula are used to make required portals in the anterior abdominal wall for inserting laparoscope and its accessory instruments after inflating the peritoneal cavity with air. Penetrating a pointed trocar is a blind method. Using the standard confirmed points for making portals, though secure, at times can lead to injury

of blood vessels of anterior abdominal wall, mainly Inferior Epigastric Artery (IEA) [1].

Injury to IEA has been reported following lower abdominal wall surgical incisions, abdominal perineocentesis and trocar placements at laparoscopic port sites resulting in the formation of abdominal wall hematomas. Trocar insertion has been reported to be exceptional cause for injury to major blood vessels such as inferior vena cava, aorta and iliac vessels.

Recent studies have shown that the rate of injury to the major blood vessels mentioned above is 0.02 - 0.04% [2] and 0.01 - 0.07% [3]. Anatomical variations of IEA in origin, course, branching pattern and termination are well reported. There is a necessity to study reference points on the abdominal surface to prevent accidental lesions of IEA. Hence mapping of IEA is important to avoid vessel injury [4].

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