

· 基础研究 ·

Corona Mortis血管解剖学研究及其临床意义

洪华兴¹, 陈海啸¹, 洪正华¹, 潘志军², 林列¹

(1. 台州医院骨科, 浙江 台州 317000; 2. 浙江大学医学院附属第二医院骨科)

【摘要】目的:探讨闭孔血管和髂外血管在腹股沟区的分支,为减少髂腹股沟入路术中出血提供解剖学基础。方法:对 25具新鲜中国成人尸体标本共 50侧半骨盆进行解剖学研究,观测闭孔血管和髂外血管在腹股沟区的分支及其吻合支(Corona Mortis血管)的大小、出现率、吻合血管行径和吻合血管至耻骨联合的距离。结果:72%(36侧)耻骨上支表面至少存在 1条血管吻合支,其中 28%(14侧)存在 2条或 3条血管吻合支,24%(12侧)同时存在动脉吻合支和静脉吻合支。耻骨上支表面的血管吻合支平均直径 2.6 mm(2.0~4.2 mm)。血管吻合支紧贴耻骨上支或髂耻隆起,几乎垂直地下行于髌臼窝壁或耻骨支后方,经闭膜管出盆腔,血管吻合支与耻骨联合的平均距离 52 mm(38~68 mm)。在此区域手术以及髌臼或骨盆前环骨折极易损伤 Corona Mortis血管。结论:闭孔血管和髂外血管的吻合支较粗,出现率高,位于耻骨上支表面。髂腹股沟手术入路应特别注意 Corona Mortis血管的存在。

【关键词】解剖学; Corona Mortis血管; 髂骨; 血管

Anatomic study of Corona Mortis blood vessel and its clinical significance HONG Hua-xing^{*}, CHEN Hai-xiao, HONG Zheng-hua, PAN Zhi-jun, LIN Lie^{*} Department of Orthopaedics, Taizhou Hospital of Zhejiang Province, Taizhou 317000, Zhejiang, China

ABSTRACT Objective: To observe branches of obturator blood vessels and external iliac blood vessels at inguinal region, so as to provide anatomic basis for reducing hemorrhage in ilioinguinal approach. **Methods:** Twenty-five pelvis specimens of fresh native adult corpse with intact soft tissues (50 hemipelvises) were observed in the study. All vessels with diameter more than 2 mm, connecting with obturator system and external iliac systems, were identified and their course were recorded. The distance from pubic symphysis to the vascular connections between the obturator and external iliac systems was measured. The incidence of vascular anastomosis were studied. **Results:** The dissections results showed 72 percent of cadaveric sides (36 sides in 50 hemipelvises) had at least one vessel communicating between the obturator system and external iliac or inferior epigastric systems on the superior pubic ramus. Among them, 28 percent (14 sides in 50 hemipelvises) had two or three vessels, and 24 percent (12 sides in 50 hemipelvises) contained both arterial and venous conduits. The average diameter of vessels was 2.6 mm (2.0~4.2 mm). The distance from pubic symphysis to the vascular connections between the obturator and external iliac systems was 52 mm (38~68 mm). It coursed over the superior pubic ramus or iliopubic eminence vertically to enter the obturator foramen. It is easily damaged in the ilioinguinal approach as an anterior approach to the acetabulum and pelvis for the operative treatment of anterior wall acetabular and anterior column pelvic fractures. **Conclusion:** Vascular connections between the obturator system and external iliac or inferior epigastric systems locates over the superior pubic ramus at high incidence and is thicker in diameter. It courses over the superior pubic ramus vertically to enter the obturator foramen and exits the pelvis. Attention needs to be paid to corona mortis vessels locating over the superior pubic ramus during the ilioinguinal approach as an anterior approach to the acetabulum and pelvis in the operative treatment of acetabular and pelvic fractures.

Key words Anatomy; Corona mortis vascular; Ilium; Blood vessels

Corona Mortis血管包括髂外血管及其分支与闭孔血管在

耻骨支表面的吻合支,以及异常起源的闭孔动、静脉。由于这些血管在骨盆前环或髌臼骨折以及髂腹股沟入路手术中容易损伤,造成大出血,因而,近年来逐渐受到国外学者的重视,并对此展开深入研究。但各国学者报道不一^[1-3],而国内尚缺

乏对 Corona Mortis血管解剖的研究。为此我们解剖观测了闭孔血管和髂外血管在腹股沟区的分支及其吻合支的大小、出现率、血管行径以及手术的危险性,以期为临床骨盆创伤救治和髂腹股沟手术入路提供解剖学基础。

1 材料与方法

1.1 材料 选用浙江大学医学院解剖教研室 25具正常成人新鲜尸体(2001年 12月 - 2003年 6月),男 19具,女 6具,尸体完好,排除明显骨盆畸形、骨折和肿瘤等病变。

1.2 方法 对骨盆附近的闭孔动、静脉和髂外动、静脉及其分支进行仔细解剖。观测双侧闭孔动、静脉和髂外动、静脉的分支,保留直径大于等于 2 mm 血管(d ≥ 2 mm),有助于剔除这些不重要的细小耻骨支血管^[1]。注意保护髂外血管和闭孔血管在耻骨支上的分支及其吻合支。记录行经于耻骨支上面的血管大小、血管行径和吻合血管至耻骨联合的距离,并摄片保存。

2 结果

78% (39例)闭孔静脉注入髂内静脉系统,22% (11例)闭孔静脉不注入髂内静脉(以下简称异常闭孔静脉),其中 16% (8例)异常闭孔静脉汇入髂外静脉,6% (3例)异常闭孔静脉汇入腹壁下静脉。Corona Mortis静脉系统包括闭孔静脉与髂外静脉或腹壁下静脉的吻合支,注入髂外静脉或腹壁下静脉的异常闭孔静脉。62% (31例)耻骨支表面至少存在 1条 Corona Mortis静脉,其中 2例存在 2支 Corona Mortis静脉。Corona

Mortis静脉平均直径为 2.8 mm (2.0 ~ 4.2 mm),Corona Mortis静脉至耻骨联合的平均距离为 54.4 mm (44 ~ 68 mm)。

76% (38例)闭孔动脉起源于髂内动脉,20% (10例)异常闭孔动脉起源于腹壁下动脉,4% (2例)异常闭孔动脉起源于髂外动脉。Corona Mortis动脉系统包括髂外动脉及其分支与闭孔动脉的吻合支,以及起源于髂外动脉或腹壁下动脉的异常闭孔动脉。38% (19例)耻骨支表面至少存在 1条 Corona Mortis动脉,其中 1例存在 2支 Corona Mortis动脉。动脉吻合支平均直径为 2.3 mm (2.0 ~ 3.2 mm),Corona Mortis动脉平均至耻骨联合的距离为 48.2 mm (38 ~ 64 mm)。

在 25具尸体共 50例半骨盆标本中,72% (36例)耻骨上支表面至少存在 1条 Corona Mortis血管(动脉或静脉),其中 28% (14例)存在 2条或 3条 Corona Mortis血管,24% (12例)同时存在 Corona Mortis动、静脉。在 25具标本中,60% (15/25)标本双侧均存在 Corona Mortis血管。Corona Mortis血管平均直径为 2.6 mm (2.0 ~ 4.2 mm),行于耻骨上支或髂耻隆起表面,几乎垂直下行于髂臼窝壁或耻骨支后面,经闭膜管出盆腔。这些血管行经闭膜管被闭孔筋膜固定,耻骨支骨折移位可造成闭孔血管及其吻合支直接或牵拉损伤。Corona Mortis血管吻合支至耻骨联合的距离平均 52 mm (38 ~ 68 mm)。位于此区域的髂臼或骨盆前环骨折以及髂腹股沟手术入路极易损伤 Corona Mortis血管。Corona Mortis血管解剖情况见图 1 - 3。

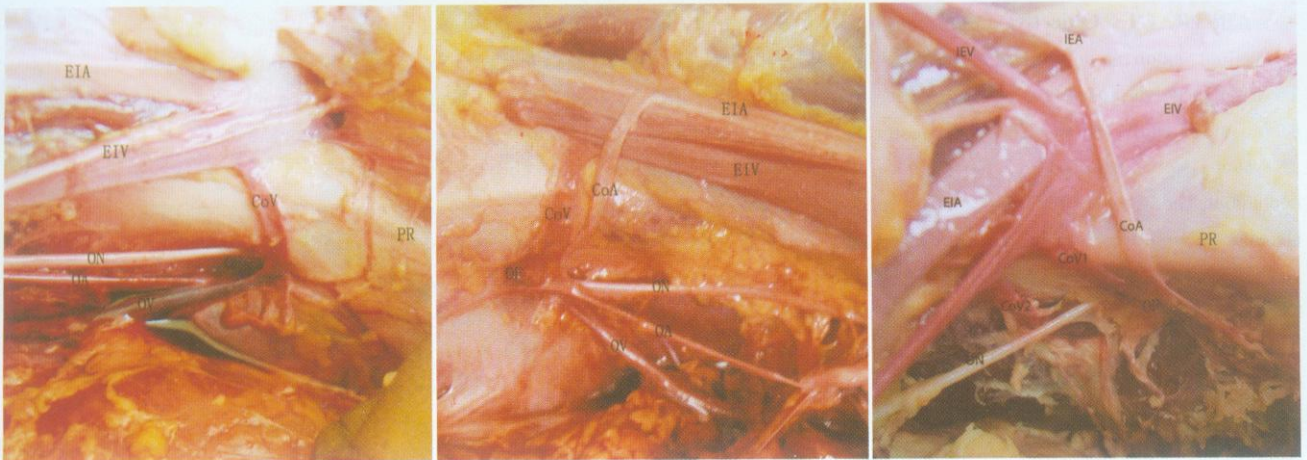


图 1 左侧半骨盆,上面观。髂外静脉和闭孔静脉在耻骨上支表面的交通支(CoV)。EA:髂外动脉。EM:髂外静脉。ON:闭孔神经。OA:闭孔动脉。OV:闭孔静脉。OF:闭孔。CoV: Corona mortis静脉。PR:耻骨支。图 2 右侧半骨盆,上面观。髂外血管和闭孔血管在耻骨支表面的动脉吻合支和交通支共存(CoA和 CoV)。EA:髂外动脉。EM:髂外静脉。IA:髂内动脉。ON:闭孔神经。OA:闭孔动脉。OV:闭孔静脉。CoV: Corona mortis静脉。CoA: Corona mortis动脉。OF:闭孔。PR:耻骨支。图 3 左侧半骨盆,上面观。2支异常闭孔静脉注入髂外静脉(CoV1和 CoV2),1支异常闭孔动脉与腹壁下动脉共干发自髂外动脉(CoV)。EA:髂外动脉。EM:髂外静脉。IEA:腹壁下动脉。IEV:腹壁下静脉。OF:闭孔。PR:耻骨支。

Fig. 1 Left side of hemi-pelvis, upper view. The venous anastomosis between the external iliac vein and obturator vein locates over the superior pubic ramus(CoV). EA: external iliac artery. EM: external iliac vein. ON: obturator nerve. OV: obturator vein. OA: obturator artery. OF: obturator foramen. PR: pubic ramus

Fig. 2 Right side of hemi-pelvis, upper view. Co-existed both arterial and venous conduits were situated between the external vessels and obturator vessels(CoA and CoV). EA: external iliac artery. EM: external iliac vein. IA: internal iliac artery. ON: obturator nerve. OA: obturator artery. OV: obturator vein. CoV: the vein of Corona Mortis. CoA: the artery of Corona Mortis. OF: obturator foramen. PR: pubic ramus

Fig. 3 Left side of hemi-pelvis, upper view. Two accessory obturator vein originating from external iliac vein (CoV1 and CoV2). One accessory obturator artery originating from the inferior epigastric artery (CoA). EA: external iliac artery. EM: external iliac vein. IEA: inferior epigastric artery. IEV: inferior epigastric vein. OF: obturator foramen. PR: pubic ramus

3 讨论

3.1 Corona Mortis血管的出现率 Letoumel于 1960年发展了髂腹股沟入路作为骨盆前方入路用于治疗髌臼以及骨盆骨折。该手术入路中髌关节的外展肌群和臀后肌群未受到干扰,且术后异位骨化(OH)明显低于其他手术入路,因而被广大骨科医生应用于骨盆或髌臼手术^[2,4]。但由于此区域解剖结构复杂,髂外动脉、静脉、股神经和丰富的血管交通支皆位于此区域,术者对髂外动、静脉和股神经经常能注意保护,而对闭孔血管系统和髂外血管系统的吻合支以及异常起源的闭孔动、静脉却未引起足够重视(Corona Mortis血管),术中易损伤这些血管,造成术中大出血。近几年来,国外学者对髂腹股沟入路中的 Corona Mortis血管展开了深入的研究,但各国学者报道不一^[1,2,5]。Missankov等^[6]报道不同种族 Corona Mortis血管出现率有较大的差异,影响了这些资料在我国的应用;而我国学者对 Corona Mortis血管的发生率尚无相关文献报道。现对 25具新鲜中国成人尸体标本进行解剖发现 72% (36侧)耻骨支表面至少存在 1条 Corona Mortis血管(动脉或静脉),38% (19侧)存在 Corona Mortis动脉,62% (31侧)存在 Corona Mortis静脉,Corona Mortis血管的发生率略低于欧美学者报道的 80%~100%^[1,3,5]。

3.2 Corona Mortis血管研究在髂腹股沟手术入路中的临床意义 Corona Mortis血管行经于耻骨支或髌趾隆起表面,几乎垂直地下行于髌臼窝壁或耻骨上支后面,经闭膜管出盆腔。术中若发生 Corona Mortis动脉或静脉损伤,断端吻合血管回缩至盆腔或闭膜管,其止血将非常困难^[2,7]。采用髂腹股沟手术入路作为髌臼及骨盆的前方入路用于治疗髌臼以及骨盆骨折,从外侧向内侧暴露将比较安全,将髂肌从髌骨内板骨膜下剥离,向内侧骨膜下剥离暴露髌臼前柱或髌趾隆起。由于髂外动脉和髂外静脉及其 Corona Mortis血管位于髌腰肌内侧,受到髌腰肌的保护而不易受伤。而在耻骨支骨折或耻骨联合分离等骨盆前环手术时,暴露血管腔隙、肌腔隙以及精索或子宫圆韧带,必须仔细分离髂外血管系统与闭孔血管系统在耻骨支表面的 Corona Mortis血管。对于已暴露的 Corona Mortis血管或异常起源的闭孔动、静脉,术中应仔细结扎,然后暴露耻骨支。de Kleuver等^[7]曾对骨盆截骨术内外侧暴露方法进行比较研究,认为外侧入路安全性高于内侧入路。以往学者常强调行经于耻骨支表面 Corona Mortis动脉损伤,而忽视了 Corona Mortis静脉损伤出血的严重性。解剖研究发现 Corona Mortis静脉出现率明显高于 Corona Mortis动脉,且静脉管径大、管壁薄,故 Corona Mortis静脉损伤出血很可能是髌腹股沟入路出血的一个主要原因。解剖测得 Corona Mortis血管平均距耻骨联合 52 mm (38~68 mm),因而手术暴露此区域时需要特别小心。

3.3 Corona Mortis血管损伤与骨盆骨折出血 高能量损伤所致的骨盆骨折是一种严重的创伤,顽固性出血及休克是引

起死亡的主要原因^[8]。既往文献都强调盆腔静脉丛、松质骨以及髓内血管损伤出血,而对行经于耻骨支或髌臼前柱的 Corona Mortis血管损伤造成大量出血的报道很少。由于 Corona Mortis血管行经于耻骨上支或髌趾隆起表面,毗邻髌臼四边形体;闭孔血管经闭孔沟出盆腔,闭孔血管在此处被闭孔筋膜固定。髌臼骨折或骨盆前环耻骨支骨折移位造成闭孔血管、腹壁下血管和 Corona Mortis血管直接或牵拉损伤,可造成危及生命的大出血^[6,9,10]。Klein等^[11]对 429例骨盆骨折进行回顾性研究(包括 85例髌臼骨折),发现 8例合并腹壁下动脉耻骨支损伤。因而骨盆前环或髌臼骨折出现血压不稳定的患者,需考虑 Corona Mortis血管损伤的可能。由于手术切开寻找损伤血管非常困难,而且手术使血肿填塞作用消失,致使进一步大出血,经皮动脉血管造影和栓塞是诊断和治疗盆腔持续性动脉出血最有效的方法^[9,10,12]。

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(收稿日期: 2005-07-15 本文编辑: 王宏)