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·专题研究·

经胸经口联合入路腔镜甲状腺癌颈侧区淋巴结清扫术临床应用

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摘 要

背景与目的：目前，经胸乳入路腔镜甲状腺癌手术已广泛开展，但伴颈侧区淋巴结转移的患者能否在腔镜下完成彻底的淋巴结清扫，特别是VI和IV区的低位淋巴结清扫，一直存在争议。本研究总结分析笔者团队近年实施的经胸经口联合入路腔镜甲状腺癌的颈侧区淋巴结清扫患者的临床资料，探索采用该术式的必要性及安全性。

方法：回顾分析2015年2月—2021年12月于厦门大学附属中山医院63例行腔镜甲状腺切除、中央区及颈侧区淋巴结清扫的甲状腺乳头状癌患者资料。其中，41例行经胸口联合入路手术（联合入路组），包括12例行经胸甲状腺切除、中央区及颈侧区淋巴结清扫后再经口补充清扫VI和IV区淋巴结，另29例行经胸和经口手术步骤合理融合，不再单独补充清扫VI及IV区淋巴结；22例行单纯经胸入路腔镜甲状腺癌根治并颈侧区淋巴结清扫术（经胸入路组）。比较两组患者的相关临床指标。

结果：两组患者的年龄、性别及肿瘤大小差异均无统计学意义（均P>0.05）。联合入路组的12例经口补充清扫颈侧区淋巴结的标本中有8例检出淋巴结，其中2例检出阳性淋巴结。联合入路组与经胸入路组获得的中央区淋巴结总数分别为（8.80±5.78）枚、（8.23±3.53）枚，颈侧区获得的淋巴结总数分别为（31.49±14.90）枚、（29.05±7.80）枚，差异均无统计学意义（P>0.05）。两组的手术时间、住院时间以及术后出血、喉返神经麻痹、甲状旁腺功能减低、副神经损伤、乳糜漏和Horner综合征等并发症发生率差异均无统计学意义（均P>0.05）。术后随访，联合入路组1例颈侧区淋巴结转移癌复发，经胸入路组1例手术清扫侧中央区淋巴结转移癌复发。

结论：经胸经口联合入路腔镜甲状腺癌颈侧区淋巴结清扫术安全、有效，与单纯经胸入路疗效相当。但补充清扫中的阳性淋巴结提示，对于淋巴结转移较多的甲状腺癌患者经胸经口联合入路腔镜甲状腺癌颈侧区淋巴结清扫术可能有一定的价值。然而，本研究病例数量较少，随访时间相对较短，有待多中心、大样本量的对照研究及长期随访结果来进一步评估该方法的安全性、有效性和必要性。

关键词 甲状腺癌，乳头状；淋巴转移；甲状腺切除术；颈淋巴结清扫术

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Application of endoscopic thyroidectomy plus lateral neck dissection via breast approach combined with transoral approach

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Abstract

Background and Aims: Endoscopic thyroid cancer surgery via breast approach has been widely carried out. However, whether a thorough lymph node dissection, especially the dissection of the lower neck level VI and IV lymph nodes, can be completed under the endoscope in patients with lateral neck lymph node metastasis remains controversial. This study was conducted to summarize and analyze the clinical data of patients undergoing endoscopic thyroidectomy plus lateral cervical lymph node dissection via breast approach combined with transoral approach performed by the author's team to investigate the necessity and safety of adopting this procedure.

Methods: The data of 63 patients with papillary thyroid cancer undergoing endoscopic thyroidectomy plus central and lateral neck dissection in Zhongshan Hospital of Xiamen University from February 2015 to December 2021 were reviewed. Of the patients, 41 cases underwent endoscopic central and lateral neck dissection via breast approach combined with transoral approach (combined approach group), including 12 cases undergoing complementary level VI and IV lymph node dissection via transoral approach after thyroidectomy plus central and lateral neck dissection via breast approach, and the other 29 cases undergoing appropriate integration of surgical procedures via both breast and transoral approaches, without additional complementary level VI and IV lymph node dissection; 22 cases underwent endoscopic thyroidectomy and lateral neck dissection via breast approach alone (breast approach group). The main clinical variables were compared between the two groups of patients.

Results: There were no differences in age, sex, and tumor size between the two groups of patients (all $P>0.05$). Lymph nodes were detected in the specimens of 8 cases among the 12 patients undergoing complementary lymph node dissection in the combined approach group. Positive lymph nodes were found in 2 of them. In combined approach group and breast approach group, the total numbers of central compartment lymph nodes obtained were 8.80±5.78 and 8.23±3.53, and the total numbers of lateral cervical lymph nodes retrieved were 31.49±14.90 and 29.05±7.80, respectively. Both differences had no statistical significance (both $P>0.05$). There were no significant differences between the two groups in the operative time, the length of postoperative hospital stay, and the incidence rates of complications such as postoperative bleeding, recurrent laryngeal nerve paralysis, hypoparathyroidism, accessory nerve injury, chyle leak and Horner's syndrome (all $P>0.05$). During postoperative follow-up, recurrence of postoperative lateral lymph node metastasis occurred in one patient in combined approach group, and recurrence of lymph node metastasis of the dissected side was found in one patient in breast approach group.

Conclusion: Endoscopic thyroidectomy plus lateral cervical lymph node dissection via breast approach combined with transoral approach is safe and effective. It has a similar efficacy as that via breast approach alone. Still, the positive lymph nodes detected by complementary lymph node dissection suggest that endoscopic lateral cervical lymph node dissection via breast approach combined with transoral approach may have particular application value for those with more lymph node metastasis.

However, the number of cases is small, and the follow-up time is relatively short in this study, so this method's safety, effectiveness, and necessity should be further evaluated by multi-center, large-sample controlled studies and long-term follow-up results.

Key words Thyroid Cancer, Papillary; Lymphatic Metastasis; Thyroidectomy; Neck Dissection

CLC number: R736.1

腔镜技术在甲状腺领域的应用越来越广，腔镜入路有经胸入路，经口入路和腋窝入路等，最初的腔镜甲状腺手术仅限于良性结节和只需要切除甲状腺和中央区的手术[1-3]。随着腔镜甲状腺手术技术的发展，原来作为禁忌证的颈侧区淋巴结转移也成为腔镜手术的适应证[4]。但是该适应证还是限定在转移的淋巴结最大直径<2 cm，没有明显的融合[5]。尽管胸乳入路腔镜甲状腺癌颈侧区淋巴结清扫已经在一些单位已经开展，但是就胸乳入路腔镜甲状腺癌伴有颈侧区转移的患者在腔镜下能否彻底清扫低位中央区和Ⅳ区下界淋巴结的争议依然存在。笔者团队初期曾探索经胸经口联合入路的腔镜甲状腺癌颈侧区淋巴结清扫[6]，现进一步总结对比近年来经胸经口联合入路的腔镜甲状腺癌颈侧区淋巴结清扫和单纯胸乳入路腔镜甲状腺癌的颈侧区淋巴结清扫结果和效果。

1　资料与方法

1.1　临床资料

回顾分析 2015 年 2 月—2021 年 12 月在厦门大学附属中山医院收治的腔镜甲状腺切除和中央区及颈侧区淋巴结清扫的甲状腺乳头状癌患者的资料。按照手术方式的不同将病例分为两组。其中，41 例行经胸口联合入路手术（联合入路组），包括 12 例行经胸行甲状腺切除和中央区和颈侧区淋巴结清扫后再经口补充清扫中央区和Ⅳ区淋巴结；另 29 例经胸和经口手术步骤合理融合，不再单独补充清扫Ⅵ和Ⅳ区淋巴结。22 例行单纯经胸入路腔镜甲状腺癌根治并颈侧区淋巴结清扫术（经胸入路组）。术前甲状腺原发灶及转移淋巴结均经细针穿刺病理确诊。术前有彩超及增强 CT 和喉镜等检查。

1.2　手术方法

1.2.1　经胸经口联合入路腔镜甲状腺癌根治并颈侧区淋巴结清扫术　患者取仰卧“人”字位，肩下垫枕使颈部处于略微后伸的状态。经口插带有神经监测的气管导管。患者全身麻醉，术前预防性应用抗生素。补充清扫手术步骤[6]：(1) 建立颈部腔镜手术空间，上至舌骨，外侧到胸锁乳突肌后缘处；(2) 经胸切除甲状腺并清扫中央区淋巴结；(3) 游离患侧胸锁乳突肌、颈内静脉外侧缘和副神经胸锁乳突肌支；(4) 经胸清扫Ⅳ，Ⅲ和Ⅱ区，取出标本；(5) 经口补充清扫Ⅳ区下界；(6) 经口补充清扫Ⅵ区下界；(7) 冲洗，缝合，放置引流管。融合清扫手术步骤：(1) 建立颈部腔镜手术空间，上至舌骨，外侧到斜方肌前后缘中点处；(2) 游离患侧胸锁乳突肌、颈内静脉外侧缘和副神经胸锁乳突肌支；(3) 经胸切除甲状腺，有时在开始颈侧区游离之前完成；(4) 经口清扫中央区；(5) 经口清扫Ⅳ区下界；(6) 经胸清扫Ⅳ，Ⅲ和Ⅱ区，取出标本。(7) 冲洗，缝合，放置引流管。经胸经口联合入路手术相关图片见图 1。

1.2.2　单纯经胸入路腔镜甲状腺癌根治并颈侧区淋巴结清扫术　共 22 例，手术流程同联合入路组的经胸入路步骤，没有经口补充清扫的步骤。

1.3　统计学处理

采用 SPSS 26.0 统计软件完成数据分析与比较。符合正态分布的参数以均数 ± 标准差（$\bar{x} \pm s$）表示，组间均数之间的比较采用独立样本 t 检验，方差齐性检验采用 Levene 检验方法。计数资料的组间比较采用 Pearson χ^2 检验，连续性校正的 χ^2 检验或 Fisher 精确检验。P<0.05 差异有统计学意义。

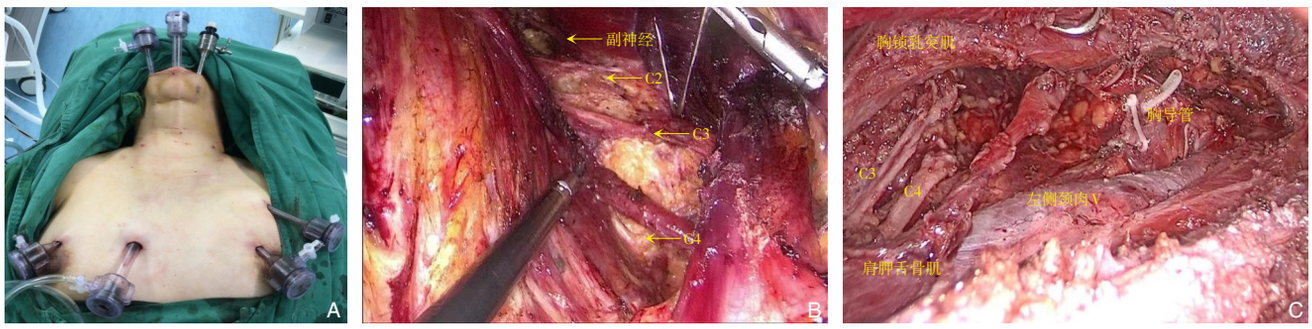

图1 经胸经口联合入路腔镜甲状腺癌的颈侧区淋巴结清扫术中照片 A：Trocar放置；B：经胸清扫颈侧区（II，III，IV）淋巴结后；C：经口清扫颈侧区颈静脉角后

Figure 1 Intraoperative views of endoscopic thyroidectomy plus lateral cervical lymph node dissection via breast approach combined with transoral approach A: Trocar placement; B: View after lateral neck dissection (II, III, IV) via breast approach; C: View after transoral lymph node dissection in the jugular vein angle

2 结 果

2.1 两组患者一般资料

联合入路组与经胸入路组年龄（*P*=0.325）、性别（*P*=0.274）及肿瘤大小（*P*=0.948）差异均无统计学意义（表1）。

表1 两组患者一般资料比较

Table 1 Comparison of the general data between the two groups

资料	联合入路组（*n*=41）	经胸入路组（*n*=22）	*P*
平均年龄（岁，$\bar{x}\pm s$）	33.10±9.20	30.91±6.44	0.325
年龄范围（岁）	17~55	21~40	—
性别[*n*（%）]			
男	8（19.5）	7（31.8）	0.274
女	33（80.5）	15（68.2）	
肿瘤大小（mm，$\bar{x}\pm s$）	17.97±8.74	18.12±8.43	0.948

2.2 手术结果比较

两组共63例患者均顺利完成含颈侧区淋巴结清扫的腔镜甲状腺手术，在研究时间内有1例准备行经胸经口联合腔镜甲状腺癌颈侧区清扫的患者因为在分离胸锁乳突肌后缘时损伤高位汇入颈内静脉的颈外静脉导致的大出血而中转开放，该患者没有纳入研究。两组的手术时间（*P*=0.439）与住院时间（*P*=0.224）均无明显的差异。联合入路组补充清扫的12例患者在经胸清扫颈侧区淋巴结后经口补充清扫IV区下界的淋巴结，有8例在补充清扫的标本中检出淋巴结，其中2例是阳性淋巴结，6例是阴性淋巴结。联合入路组与经胸入路组在获得的中央区淋巴结总数与颈侧区获得的淋巴结总数均无明显差异（*P*=0.671、*P*=0.477）（表2）。

表2 两组患者手术指标比较（$\bar{x}\pm s$）

Table 2 Comparison of the surgical variables between the two groups ($\bar{x}\pm s$)

项目	联合入路组（*n*=41）	经胸入路组（*n*=22）	*P*
手术时间（min）	298.46±59.67	310.00±48.23	0.439
术后住院时间（d）	4.17±0.80	3.91±0.81	0.224
肿瘤大小（mm）	17.97±8.74	18.12±8.43	0.948
淋巴结数目（枚）			
中央区	8.80±5.78	8.23±3.53	0.671
颈侧区	31.49±14.90	29.05±7.80	0.477

2.3　术后并发症情况比较

两组患者在术后出血、喉返神经麻痹、甲状旁腺功能减退、副神经损伤、乳糜漏、Horner 综合征等发生率差异均无统计学意义（均 $P>0.05$）（表 3）。

表 3　两组术后并发症比较[n（%）]

Table 3　Comparison of the postoperative complications between the two groups [n (%)]

并发症	联合入路组（n=41）	经胸入路组（n=22）	P
术后出血	0(0.0)	0(0.0)	—
短暂喉返神经麻痹	3(7.3)	1(4.5)	1.000
永久喉返神经麻痹	1(2.4)	0(0.0)	1.000
短暂甲状旁腺功能减退	6(14.6)	4(18.2)	0.995
永久甲状旁腺功能减退	0(0.0)	0(0.0)	—
副神经损伤	2(4.9)	2(9.1)	0.606
乳糜漏	1(2.4)	1(4.5)	1.000
Horner综合征	1(2.4)	0(0.0)	1.000
术后复发淋巴结转移	1(2.4)	1(4.5)	1.000

2.4　术后随访

联合入路组有 1 例术后 2 年随访发现清扫后的同侧颈侧区淋巴结转移复发，经诊断明确后行射频消融治愈。经胸入路组有 1 例术后 1 年发现清扫侧中央区淋巴结有淋巴结转移复发，行开放手术清扫中央区淋巴结治愈。

3　讨　论

甲状腺癌容易发生淋巴结转移，转移的概率有 30%~80%[7]。甲状腺癌有颈侧区淋巴结转移时需要行甲状腺切除+中央区淋巴结清扫+颈侧区淋巴结清扫[8-9]，传统的开放手术是安全和有效的，但是会在颈部留下较长的“L”形或者横弧形的颈部手术疤痕。颈部手术疤痕或多或少会影响患者的自信心以及社交焦虑，特别是对年轻女性患者的工作、生活、及婚姻产生一定影响[10]。为了减轻颈部显眼的手术疤痕，2008 年开始意大利比萨大学的 Miccoli 教授、章德广教授等[11-12]先后将腔镜辅助小切口技术应用于颈侧区淋巴结清扫，再后来有学者[13]尝试将颈部的切口移到锁骨下。全腔镜的胸乳入路甲状腺癌手术早期只应用在甲状腺切除和中央区淋巴结清扫[14-15]，接下来不断有外科医生[16-20]尝试胸乳入路甲状腺癌的颈侧区淋巴结清扫。当然腔镜的颈侧区淋巴结清扫主要应用于转移淋巴结<2 cm 的患者，这些都是腔镜颈侧区淋巴结清扫的较好适应证[21]。但是自胸乳入路腔镜甲状腺癌颈侧区淋巴结清扫开展以来，关于腔镜是否能达到淋巴结清扫彻底的质疑不绝于耳，特别是对于胸骨后中央区和锁骨后Ⅳ区淋巴结是否能清扫彻底的质疑[22-25]。樊友本教授团队[26-27]尝试从经口行颈侧区的淋巴结清扫，虽然能解决胸骨后和锁骨后的淋巴结清扫问题，但是对于Ⅱ区淋巴结清扫受到限制。为解决腔镜下有颈侧区淋巴结转移患者淋巴结清扫彻底性问题，笔者团队提出了经胸经口联合入路的腔镜甲状腺癌手术入路，先在中央区尝试，发现可以弥补经胸乳入路中央区淋巴结清扫的不足[28]，为进一步研究经胸经口联合入路腔镜甲状腺癌手术方式，进而在甲状腺癌有颈侧区转移的患者开展探索[6]。

在开展早期，团队先行经胸完成所有的甲状腺切除，中央区和颈侧区的淋巴结清扫，再经口补充清扫验证是否清扫彻底。前期补充清扫的 12 例患者中有 8 例在颈侧区补充清扫出淋巴结，其中 6 例补充清扫出来的淋巴结是阴性，2 例是有转移的阳性淋巴结。该 12 例患者的结果证实了经胸手术时经口补充清扫淋巴结的必要性。本研究发现，联合入路组与经胸入路组在中央区和颈侧区淋巴结清扫数量在统计学上无明显差异。理论上联合入路组清扫的淋巴结总数应该多于经胸入路组，但是本研究没有发现这种规律，原因可能为联合经口手术多获得的淋巴结数目在总体淋巴结数中占比较低，掩盖了这种差异。

在手术时间上，早期因团队处于技术探索阶段，手术过程不熟练，联合入路组要比经胸入路组手术时间长，后期流程优化、技术熟练，手术

时间就会明显缩短，后期联合入路组的手术时间跟经胸入路组相比差异无统计学意义。手术后甲状腺相关并发症，两组无明显差别。而入路相关的并发症上，联合入路组会出现下颌处肿胀麻木感和紧缩感，这种感觉在术后2~4周会逐渐消失。本研究也未发现经胸经口联合入路中发生充气经口腔镜甲状腺可能并发的CO_2气体栓塞，经口腔镜甲状腺手术中CO_2气体栓塞主要发生在建腔过程颈前静脉破裂时[29]，而胸口入路的建腔是在胸乳入路时完成，经口放置Trocar时颈部的腔已经建好了，所以不会发生该并发症。

术后随访发现联合入路组有1例出现术后淋巴结转移癌复发，经胸入路组有1例出现第1次手术的清扫侧中央区淋巴结转移癌复发。两组在术后复发发生率上无统计学差异，一方面可能跟随访时间短有关，另一方面可能与患者例数少也有关。两组是否在复发转移上有差别还有待于扩大样本量和更长的随访时间来进一步判断。

本研究结果显示，在一定的适应证下，经胸经口联合入路腔镜甲状腺癌颈侧区淋巴结清扫是安全可行的，也是必要的。虽然会带来下颌部短时间的皮肤麻木感和紧缩感，但在Ⅳ区和Ⅵ区的低位淋巴结清扫彻底性方面有明显的优势。胸口联合入路不会增加甲状腺手术相关的并发症。但该研究病例数量较少，随访时间相对较短，有待多中心、大样本量的随机对照研究和长期的随访结果来进一步评估经胸经口联合入路腔镜甲状腺癌颈侧区淋巴结清扫的安全性、有效性和必要性。当然随着达芬奇机器人手术在外科的应用，将来机器人在甲状腺癌颈侧区淋巴结清扫中将会发挥重要的作用[30-32]。

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