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• 甲状腺外科专题研究 •

甲状腺微小乳头状癌侧颈淋巴结转移相关危险因素与预测指标分析

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摘要

背景与目的: 甲状腺微小乳头状癌 (PTMC) 发病率逐年增高, 侧颈淋巴结转移 (LLNM) 时将影响患者生存率。本文旨在探讨 PTMC 发生 LLNM 的相关危险因素与预测指标, 为临床诊疗依据提供参考。

方法: 回顾性分析大连市友谊医院 2015 年 1 月—2020 年 6 月收治的 PTMC 患者的临床资料。观察临床资料除了 LLNM 的发生情况, 还包括性别、年龄、肿瘤数目、肿瘤大小、肿瘤位置、病变腺叶、体质量指数、是否侵犯甲状腺被膜、是否合并甲状腺其他疾病 (桥本甲状腺炎、结节性甲状腺肿), 以及是否伴有中央区淋巴结转移 (CLNM)。

结果: 共纳入 342 例 PTMC 患者, 其中发生 LLNM 的 33 例 (9.6%), 发生 CLNM 的 142 例 (41.5%), 发生 CLNM 并 LLNM 者 25 例 (7.3%); 33 例 LLNM 患者中, 8 例 (24.2%) 无 CLNM。单因素分析结果显示, 男性、肿瘤直径 ≥ 5 mm、甲状腺被膜侵犯、CLNM 的患者更容易发生 LLNM (均 $P < 0.05$)。多因素分析结果显示, CLNM 转移数目是 LLNM 的独立危险因素 ($OR = 1.195$, $P < 0.05$)。ROC 曲线分析结果显示, CLNM 数目预测 LLNM 的 AUC 为 0.621, 临界值为 4.5 枚, 特异度为 0.897 和敏感度为 0.103。

结论: CLNM 数目与 PTMC 患者发生 LLNM 密切相关, CLNM 数目可为治疗性侧颈淋巴结清扫提供一定的量化参考。

关键词

甲状腺癌, 乳头状; 淋巴转移; 颈淋巴结清扫术

中图分类号: R736.1

Analysis of risk factors and predictive variables for lateral cervical lymph node metastasis in papillary thyroid microcarcinoma

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Abstract

Background and Aims: The incidence of papillary thyroid microcarcinoma (PTMC) has been increasing over the past years, and the presence of lateral lymph node metastasis (LLNM) will affect the survival rates of patients. The purpose of this study was to investigate the risk factors and predictive variables for the occurrence of LLNM in PTMC, so as to provide reference for clinical diagnosis and treatment.

Methods: The clinical data of PTMC patients treated in Dalian Friendship Hospital from January 2015 to June

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2020 were retrospectively analyzed. Except for the occurrence of LLNM, the clinical variables observed included sex, age, and the number, size, and location of tumor, as well as the affected glandular lobes, body mass index, and the presence or absence of thyroid capsule invasion, other concomitant thyroid diseases (Hashimoto's thyroiditis, nodular goiter), and combined central lymph node metastasis (CLNM).

Results: A total of 342 PTMC patients were enrolled, of whom, LLNM occurred in 33 cases (9.6%), CLNM occurred in 142 cases (41.5%), and 25 cases (7.3%) had both CLNM and LLNM. Of the 33 patients with LLNM, 8 cases (24.2%) had no CLNM. Univariate analysis showed that patients with male sex, tumor diameter ≥ 5 mm, capsule invasion and CLNM were more likely to develop LLNM (all $P < 0.05$). Multivariate analysis showed that the number of CLNM was an independent risk factor for LLNM ($OR = 1.195$, $P < 0.05$). ROC analysis showed that the AUC of CLNM number for estimating LLNM was 0.621, and the cut-off value was 4.5, with a specificity of 0.897 and sensitivity of 0.103.

Conclusion: The number of CLNM is closely related to the LLNM in PTMC patients, which can provide certain quantitative reference for therapeutic lateral lymph node dissection.

Key words

Thyroid Cancer, Papillary; Lymphatic Metastasis; Neck Dissection

CLC number: R736.1

甲状腺癌 (thyroid carcinoma, TC) 是内分泌系统中最常见的癌症之一, 约占所有恶性肿瘤的1%, 占头颈部恶性肿瘤的30%~35%。在过去的10年中, 其发病率在全球范围内逐渐上升^[1]。甲状腺乳头状癌 (papillary thyroid carcinoma, PTC) 约占TC的80%~85%, 10年生存率约占90%以上^[2]。甲状腺微小乳头状癌 (papillary thyroid microcarcinoma, PTMC) 是指肿瘤直径 ≤ 1 cm的PTC。由于高分辨率超声检查和对 < 3 mm的结节进行细针穿刺活检 (fine-needle aspiration, FNA) 等技术的成熟提高了PTMC的检出率^[3]。尽管之前认为PTMC侵袭性较低^[4-5], 但是, 颈部淋巴结转移依然是预测病死率及不良预后的指标, 其中15%的患者可能出现原发灶的局部浸润和治疗抵抗^[6]。PTMC患者的颈淋巴结转移率约为30%^[7], 少数PTMC患者在早期就发现伴有远处转移, 包括肺、骨和脑^[8]。最近的一些研究报道指出颈淋巴结转移可以影响生存率, 尤其老年患者^[9-10], 特别是那些患有局部晚期、区域性或远处转移的患者, 疾病死亡风险更高。因此, 对于PTMC患者要细致评估侧颈淋巴结有无转移。《甲状腺微小乳头状癌诊断与治疗中国专家共识》^[11]中对于cN0的PTC患者推荐行预防性中央区淋巴结清扫, 而对于侧颈淋巴结是否清扫尚无定论。清扫侧颈淋巴结会使手术范围扩大将增加术中及术后并发症的发生几率, 因而评估侧颈淋巴结转移 (lateral lymph node metastasis, LLNM) 情况, 继而制定合理手术范围对PTMC的治疗尤为重要。对于PTMC患者, 侧

颈淋巴结是否需要清扫, 从而降低远处转移及改善患者预后具有重要临床意义。基于此, 本研究主要目的是发现PTMC与LLNM的相关危险因素, 从而发现PTMC伴有LLNM的影响因素, 这将有助于对PTMC患者进行个体化治疗, 为临床诊治规范性提供依据。

1 资料与方法

1.1 一般资料

收集本院耳鼻咽喉头颈外科2015年1月—2020年6月间收治的PTMC患者。纳入标准: (1) 术后确诊为PTMC患者; (2) 初次手术患者; (3) 行预防性中央区淋巴结清扫和 (或) 侧颈淋巴结清扫, 且具有完整的临床及病理学资料。排除标准: (1) 年龄 < 18 岁; (2) 颈部手术病史; (3) 颈部放射线接触史; (4) 家族遗传史; (5) 合并其他恶性肿瘤或远处转移。根据纳排标准纳入符合标准的PTMC患者共342例, 其中男87例, 女性55例, 男女比例约1:3; 年龄18~78岁, 平均年龄为 (47.38 ± 12.26) 岁。

1.2 手术方法

手术由同一手术医师操作, 手术方式: 对所有患者进行术中冷冻切片以确定结节为恶性, 如术中病理已证实为单侧癌灶者行患侧腺叶切除+中央区淋巴结清扫术, 如术中病理证实为双侧癌灶者行甲状腺全切+双侧中央区淋巴结清扫术, 对于术前辅助检查 (彩超、颈部CT、肿物细针穿刺活检病理FNAB提示) 评估存在可疑转移的侧颈淋巴

结行中央区+相应选择性侧颈淋巴结清扫治疗,术后标本均送常规病理检查。

1.3 统计学处理

使用SPSS 22.0统计软件进行分析,计量资料用均数 \pm 标准差($\bar{x}\pm s$)表示,组间比较采用 t 检验,计数资料用例数(百分率)[$n(\%)$]表示,组间比较采用 χ^2 检验,多因素分析采用二分类Logistic回归分析,ROC曲线用于确定相关因素预测发生LLNM的最佳截断值。 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 基本临床数据

本研究共纳入342例PTMC患者,截止到随访结束,全部病例均存活,无远处转移。术后病理证实中央区淋巴结转移(cervical lymph node metastasis, CLNM)者142例(41.5%),

LLNM者33例(9.6%), CLNM伴LLNM者25例(7.3%),不伴CLNM及LLNM者192例。33例LLNM患者中,8例(24.2%)LLNM无CLNM,定义为跳跃性转移。共清扫中央区淋巴结1 868枚,其中病理明确转移中央区淋巴结368枚,清扫侧颈淋巴结总数为966枚,病理明确转移侧颈淋巴结为123枚。清扫伴有LLNM的中央淋巴结91枚,清扫不伴LLNM的中央淋巴结277枚。

2.2 其他因素与LLNM关系的单因素分析

单因素分析发现PTMC伴有LLNM与年龄、肿瘤数目、肿瘤位置、累及腺叶数目、是否伴有桥本甲状腺炎(Hashimoto thyroiditis, HT)、是否伴有结节性甲状腺肿(nodular goiter, NG)、身体质量指数(body mass index, BMI)等因素无明显关系(均 $P>0.05$),性别、肿瘤大小(肿瘤的最大直径)是否 ≥ 5 mm、肿瘤是否侵犯甲状腺被膜、CLNM情况与PTMC发生LLNM有明显关系(均 $P<0.05$) (表1)。

表1 PTMC发生LLNM单因素分析

Table 1 Univariate analysis of factors for LLNM in PTMC

因素	例数(n)	LLNM($n=33$)	非LLNM($n=309$)	χ^2/t	P
性别 [$n(\%)$]					
男	87	14 (42.4)	73 (23.6)	5.560	0.018
女	255	19 (57.6)	236 (76.4)		
年龄 [岁, $n(\%)$]					
< 55	230	26 (78.8)	204 (66.0)	2.207	0.137
≥ 55	113	7 (21.2)	105 (34.0)		
肿瘤数目 [个, $n(\%)$]					
1	239	20 (60.0)	219 (70.9)	1.494	0.222
≥ 2	103	13 (39.4)	90 (29.1)		
肿瘤大小 [mm, $n(\%)$]					
< 5	59	1 (3.0)	58 (18.8)	5.174	0.023
≥ 5	283	32 (97.0)	251 (81.2)		
肿瘤位置 [$n(\%)$]					
上极	110	15 (45.5)	95 (30.7)	2.957	0.086
非上极	232	18 (54.5)	214 (69.3)		
病变腺叶 [$n(\%)$]					
单侧	278	25 (75.8)	253 (81.9)	0.734	0.392
双侧	64	8 (24.2)	56 (18.1)		
甲状腺被膜侵犯 [$n(\%)$]					
是	128	18 (54.5)	110 (35.6)	4.570	0.033
否	214	15 (45.5)	199 (64.4)		
合并 HT [$n(\%)$]					
是	74	10 (30.3)	64 (20.7)	1.618	0.203
否	268	23 (69.7)	245 (79.3)		
合并 NG [$n(\%)$]					
是	70	9 (27.3)	61 (19.7)	1.039	0.308
否	272	24 (72.7)	248 (80.3)		
BMI (kg/m^2 , $\bar{x}\pm s$)	342	24.74 \pm 3.48	24.74 \pm 4.49	0.000	0.993
CLNM [$n(\%)$]					
是	142	25 (75.8)	117 (37.9)	17.632	0.000
否	200	8 (24.2)	192 (62.1)		

2.3 LLNM 危险因素的多因素分析

多因素二元Logistic回归分析发现, CLNM数目是PTMC发生侧颈淋巴结转移的独立危险因素(OR=1.195, $P<0.05$) (表2)。

表2 PTMC 发生 LLNM 的多因素分析

相关因素	P	OR	95% CI
性别	0.102	1.927	0.878~4.228
肿瘤大小	0.633	1.555	0.254~9.535
腺外侵犯	0.400	0.707	0.316~1.584
CLNM 数目	0.047	1.195	1.002~1.425
中央区转移	0.071	0.396	0.145~1.082

2.4 ROC 曲线分析

以CLNM数目作为判断PTMC侧颈淋巴结转移情况的指标绘制ROC曲线(图1), LLNM对应的曲线下面积(AUC)为0.621, 根据Youden指数的最大值以确定CLNM数目的临界值为4.5枚, CLNM数目临界值的特异度为0.897和敏感度为0.103。本组患者中, CLNM转移数目 ≥ 4.5 枚的例数为20例, 其中伴LLNM例数为8例(40.0%)。

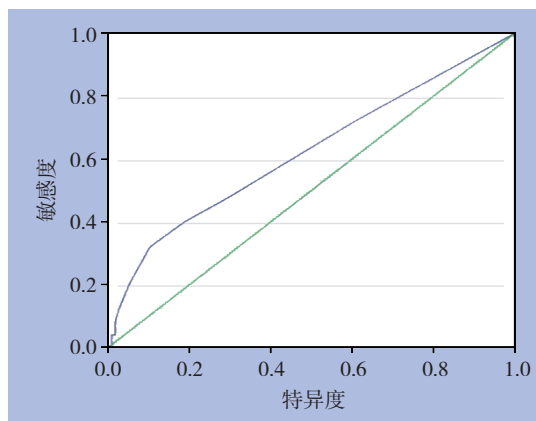


图1 CLNM 数目评估 LLNM 的 ROC 曲线

Figure 1 ROC curve of CLNM number for estimating LLNM

3 讨论

PTC预后良好, 被认为是具有“极低恶性潜能”的肿瘤^[12-13]。淋巴结转移与癌症复发及预后密切相关, 是PTMC患者局部复发的有效预测指标^[14]。PTMC患者中, CLNM发生率约为41%~64%^[15-16], LLNM发生率约为21%^[17-18]。在PTMC术后报道中, 该疾病病死率为1%, 局部复发率为2%~6%, 远处复发率为1%~2%^[19-20]。Nilubol等^[21]报道

PTMC患者占甲状腺癌相关死亡患者的5.1%。许多研究指出CLNM是PTMC发生LLNM的显著预测因素^[22-25], 有学者^[25-26]认为CLNM数目较多时可考虑行侧颈区淋巴结清扫, 减少复发。本研究回顾分析我院5年内342例PTMC患者的临床资料, 探讨LLNM的危险因素及CLNM数目在预测PTMC发生侧颈淋巴结转移中的重要性, 为临床诊治提供参考。

本研究中单因素分析显示性别(男性)、原发性肿瘤大小 ≥ 5 mm、肿瘤侵犯甲状腺被膜与侧颈淋巴结转移显著相关。有学者^[25]认为性别(男性)与LLNM显著相关, 本研究也得出相同的结论。Kwak等^[18, 27]发现PTMC患者肿瘤大小与LLNM无明显相关性。然而, 一些研究表明, PTC肿瘤直径增大是LLNM的危险因素, 例如肿瘤最大直径 ≥ 5 mm等^[6, 28], 同样, 单因素分析中发现, 肿瘤直径5 mm的患者更容易出现LLNM。研究^[17, 25-26, 29]指出被膜侵犯可以预测淋巴结转移的风险, 这与本研究结果相符。

Back等^[30]报道, CLNM是PTMC发生LLNM的独立预测因子。研究^[25, 31-32]发现CLNM与LLNM之间存在密切关系, 提示有CLNM的PTMC患者更容易发生LLNM。Lim等^[24]报道称, CLNM数目的平均数与LLNM显著相关。同样, 本研究发现CLNM与PTMC发生LLNM的风险有关, 且CLNM数量与PTMC伴LLNM的风险增加(OR=1.195, $P<0.05$), PTMC侧颈淋巴结转移率随CLNM数目的增加而上升。因此, 早期识别LLNM以及采取正确的手术方法可能为患者提供良好的预后。先前研究^[24-25]显示CLNM ≥ 3 与LLNM存在显著相关。在本文中, 通过回归分析确定了CLNM数目与LLNM密切相关, 并进一步用ROC曲线计算了CLNM数目的截断值与预后之间的关系, CLNM数目截断值为4.5枚。笔者认为CLNM数目对预测LLNM有一定价值。CLNM数目可以作为一个重要的变量, 可为减少不必要的治疗性侧颈淋巴结清扫提供参考。Lim等^[24]指出, 从中央区解剖的标本可以在不到30 min的时间内通过冷冻切片进行分析, 以确认CLNM, 并对转移数目进行定量测定。因此, 术中冷冻切片能较准确的确定CLNM数目, 结合术前辅助检查, 将有助于外科医生决定是否需要对侧颈淋巴结进行进一步治疗。但本研究结果中CLNM数目依赖术中解剖快速病理诊断确定数目, 可能存在误差, 术前无法准确评估CLNM的数量, 故需要大量研究来进一步确定术前可以预知侧颈淋巴结

是否转移的相关其他证据指导临床。

综上所述,对于PTMC伴CLNM数目较多的患者,需警惕LLNM,结合术前辅助检查结果,术中规范清扫中央区淋巴结,必要时行侧颈淋巴结清扫,以消除临床隐匿性侧颈转移性淋巴结,为PTMC患者制定合理精准的个体化手术方案,减少复发及二次手术,提高生存率。

参考文献

- [1] Kim E, Park JS, Son KR, et al. Preoperative diagnosis of cervical metastatic lymph nodes in papillary thyroid carcinoma: comparison of ultrasound, computed tomography, and combined ultrasound with computed tomography[J]. *Thyroid*, 2008, 18(4):411-418. doi: 10.1089/thy.2007.0269.
- [2] Park JP, Roh JL, Lee JH, et al. Risk factors for central neck lymph node metastasis of clinically noninvasive, node-negative papillary thyroid microcarcinoma[J]. *Am J Surg*, 2014, 208(3):412-418. doi: 10.1016/j.amjsurg.2013.10.032.
- [3] Du LB, Wang YQ, Sun XH, et al. Thyroid cancer: trends in incidence, mortality and clinical-pathological patterns in Zhejiang Province, Southeast China[J]. *BMC Cancer*, 2018, 18(1):291. doi: 10.1186/s12885-018-4081-7.
- [4] Moosa M, Mazzaferrri EL. Occult thyroid carcinoma[J]. *Cancer*, 1997, 10:180-188. doi: 10.1055/s-0029-1220206.
- [5] Hughes DT, Haymart MR, Miller BS, et al. The most commonly occurring papillary thyroid cancer in the United States is now a microcarcinoma in a patient older than 45 years[J]. *Thyroid*, 2011, 21(3):231-236. doi: 10.1089/thy.2010.0137.
- [6] Zhan SH, Luo D, Ge W, et al. Clinicopathological predictors of occult lateral neck lymph node metastasis in papillary thyroid cancer: A meta-analysis[J]. *Head Neck*, 2019, 41(7):2441-2449. doi: 10.1002/hed.25762.
- [7] Kurukahvecioglu O, Dikmen K, Bostanci H, et al. An Approach to Macroscopic Central Lymph Nodes Detected during Surgery in Patients with Thyroid Micropapillary Carcinoma: Should We Resort to Dissection?[J]. *Int J Endocrinol*, 2017:5814610. doi: 10.1155/2017/5814610.
- [8] Ito Y, Miyauchi A. A therapeutic strategy for incidentally detected papillary microcarcinoma of the thyroid[J]. *Nat Clin Pract Endocrinol Metab*, 2007, 3(3):240-248. doi: 10.1038/npendmet0428.
- [9] Lundgren CI, Hall P, Dickman PW, et al. Clinically significant prognostic factors for differentiated thyroid carcinoma: a population-based, nested case-control study[J]. *Cancer*, 2006, 106(3):524-531. doi: 10.1002/cncr.21653.
- [10] Bhattacharyya N. Surgical Treatment of Cervical Nodal Metastases in Patients With Papillary Thyroid Carcinoma[J]. *Arch Otolaryngol Head Neck Surg*, 2003, 129(10):1101-1104. doi: 10.1001/archotol.129.10.1101.
- [11] 中国抗癌协会甲状腺癌专业委员会(CATO). 甲状腺微小乳头状癌诊断与治疗中国专家共识(2016版)[J]. *中国肿瘤临床*, 2016, 43(10):405-411. doi: 10.3969/j.issn.1000-8179.2016.10.001. Chinese Association of Thyroid Oncology (CATO). Chinese expert consensus on diagnosis and treatment of papillary thyroid microcarcinoma (2016 edition)[J]. *Chinese Journal of Clinical Oncology*, 2016, 43(10):405-411. doi: 10.3969/j.issn.1000-8179.2016.10.001.
- [12] Thompson LD. Ninety-four cases of encapsulated follicular variant of papillary thyroid carcinoma: A name change to Noninvasive Follicular Thyroid Neoplasm with Papillary-like Nuclear Features would help prevent overtreatment[J]. *Mod Pathol*, 2016, 29(7):698-707. doi: 10.1038/modpathol.2016.65.
- [13] Amendoeira I, Maia T, Sobrinho-Simões M. Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP): impact on the reclassification of thyroid nodules[J]. *Endocr Relat Cancer*, 2018, 25(4):R247-258. doi: 10.1530/ERC-17-0513.
- [14] Pisanu A, Reccia I, Nardello O, et al. Risk factors for nodal metastasis and recurrence among patients with papillary thyroid microcarcinoma: differences in clinical relevance between nonincidental and incidental tumors[J]. *World J Surg*, 2009, 33(3):460-468. doi: 10.1007/s00268-008-9870-8.
- [15] Xiao GZ, Gao L. Central lymph node metastasis: is it a reliable indicator of lateral node involvement in papillary thyroid carcinoma?[J]. *World J Surg*, 2010, 34(2):237-241. doi: 10.1007/s00268-009-0347-1.
- [16] Kutler DI, Crummey AD, Kuhel WI. Routine central compartment lymph node dissection for patients with papillary thyroid carcinoma[J]. *Head Neck*, 2012, 34(2):260-263. doi: 10.1002/hed.21728.
- [17] Xu B, Serrette R, Tuttle RM, et al. How Many Papillae in Conventional Papillary Carcinoma? A Clinical Evidence-Based Pathology Study of 235 Unifocal Encapsulated Papillary Thyroid Carcinomas, with Emphasis on the Diagnosis of Noninvasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features[J]. *Thyroid*, 2019, 29(12):1792-1803. doi: 10.1089/thy.2019.0328.
- [18] Kwak JY, Kim EK, Kim MJ, et al. Papillary Microcarcinoma of the Thyroid: Predicting Factors of Lateral Neck Node Metastasis[J]. *Ann Surg Oncol*, 2009, 16(5):1348-1355. doi: 10.1245/s10434-

- 009-0384-x.
- [19] Noguchi S, Yamashita H, Uchino S, et al. Papillary microcarcinoma[J]. World J Surg, 2008, 32(5):747-753. doi: 10.1007/s00268-007-9453-0.
- [20] Yu XM, Wan Y, Sippel RS, et al. Should all papillary thyroid microcarcinomas be aggressively treated? An analysis of 18,445 cases[J]. Ann Surg, 2011, 254(4):653-660. doi: 10.1097/SLA.0b013e318230036d.
- [21] Nilubol N, Kebebew E. Should small papillary thyroid cancer be observed? A population-based study[J]. Cancer, 2015, 121(7):1017-1024. doi: 10.1002/cncr.29123.
- [22] Kim SK, Park I, Woo JW, et al. Predictive Factors for Lymph Node Metastasis in Papillary Thyroid Microcarcinoma[J]. Ann Surg Oncol, 2016, 23(9):2866-2873. doi: 10.1245/s10434-016-5225-0.
- [23] Liu Z, Lei J, Liu Y, et al. Preoperative predictors of lateral neck lymph node metastasis in papillary thyroid microcarcinoma[J]. Medicine (Baltimore), 2017, 96(10):e6240. doi: 10.1097/MD.00000000000006240.
- [24] Lim YS, Lee JC, Lee YS, et al. Lateral cervical lymph node metastases from papillary thyroid carcinoma: Predictive factors of nodal metastasis[J]. Surgery, 2011, 150(1):116-121. doi: 10.1016/j.surg.2011.02.003.
- [25] 沈文亮, 吕晶, 黑虎, 等. cN0期甲状腺微小乳头状癌侧颈淋巴结转移危险因素分析[J]. 中国普通外科杂志, 2019, 28(5):551-557. doi:10.7659/j.issn.1005-6947.2019.05.006.
- Shen WL, Lu J, Hei H, et al. Analysis of risk factors for lateral neck lymph node metastasis in cN0 papillary thyroid microcarcinoma[J]. Chinese Journal of General Surgery, 2019, 28(5):551-557. doi:10.7659/j.issn.1005-6947.2019.05.006.
- [26] 李思齐, 李燕, 张毅, 等. 甲状腺乳头状癌术中喉前及气管前淋巴结联合冷冻病理检测的临床价值[J]. 中国普通外科杂志, 2018, 27(11):1387-1392. doi:10.7659/j.issn.1005-6947.2018.11.004.
- Li SQ, Li Y, Zhang Y, et al. Clinical value of intraoperative frozen section analysis for prelaryngeal and pretracheal lymph nodes in surgery for papillary thyroid carcinoma[J]. Chinese Journal of General Surgery, 2018, 27(11):1387-1392. doi:10.7659/j.issn.1005-6947.2018.11.004.
- [27] Zeng RC, Li Q, Lin KL, et al. Predicting the factors of lateral lymph node metastasis in papillary microcarcinoma of the thyroid in eastern China[J]. Clin Transl Oncol, 2012, 14(11):842-847. doi: 10.1007/s12094-012-0875-2.
- [28] Luo Y, Zhao Y, Chen K, et al. Clinical analysis of cervical lymph node metastasis risk factors in patients with papillary thyroid microcarcinoma[J]. J Endocrinol Invest, 2019, 42(2):227-236. doi: 10.1007/s40618-018-0908-y.
- [29] Papaioannou C, Lamnisos D, Kyriacou K, et al. Lymph Node Metastasis and Extrathyroidal Extension in Papillary Thyroid Microcarcinoma in Cyprus: Suspicious Subcentimeter Nodules Should Undergo FNA When Multifocality is Suspected[J]. J Thyroid Res, 2020, 2020:3567658. doi: 10.1155/2020/3567658.
- [30] Back K, Kim JS, Kim JH, et al. Superior Located Papillary Thyroid Microcarcinoma is a Risk Factor for Lateral Lymph Node Metastasis[J]. Ann Surg Oncol, 2019, 26(12):3992-4001. doi: 10.1245/s10434-019-07587-2.
- [31] Gong YQ, Yang J, Yan SP, et al. Pattern of and clinicopathologic risk factors for lateral lymph node metastases in papillary thyroid carcinoma patients with lateral cervical lymphadenopathy[J]. Medicine (Baltimore), 2018, 97(36):e12263. doi: 10.1097/MD.00000000000012263.
- [32] Kim K, Zheng XJ, Kim JK, et al. The contributing factors for lateral neck lymph node metastasis in papillary thyroid microcarcinoma (PTMC)[J]. Endocrine, 2020, 69(1):149-156. doi: 10.1007/s12020-020-02251-2.

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