

doi: 10.13241/j.cnki.pmb.2020.08.033

超声诊断甲状腺乳头状癌颈部淋巴结转移的临床价值 及其血流参数与淋巴结转移的相关性分析*

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摘要 目的:研究超声诊断甲状腺乳头状癌(PTC)颈部淋巴结转移的临床价值,并分析其血流参数与淋巴结转移的相关性。**方法:**选取2014年1月~2019年9月于我院接受诊治的78例PTC患者实施研究。按颈部淋巴结的转移情况将其分成转移组(42例)和非转移组(36例)。比较两组超声声像图特征,并分析超声诊断PTC颈部淋巴结转移的灵敏度、特异度、准确度。此外,对比两组彩色多普勒超声相关血流参数,分析彩色多普勒超声血流参数与淋巴结转移的相关性。**结果:**转移组淋巴门及纵横比 ≥ 2 人数占比低于非转移组,而钙化、囊性变人数占比高于非转移组(均 $P<0.05$)。以病理诊断为金标准,超声诊断PTC颈部淋巴结转移的灵敏度、特异度、准确度分别为95.24%、97.22%、96.15%。转移组与非转移组的收缩期加速时间(AT)对比差异无统计学意义($P>0.05$);转移组收缩期峰值流速(PSV)、搏动指数(PI)、阻力指数(RI)均高于非转移组(均 $P<0.05$)。经Pearson相关性分析可得:PSV、PI、RI与淋巴结转移均呈正相关关系(均 $P<0.05$)。**结论:**超声诊断PTC颈部淋巴结转移的临床价值较高,且其血流参数与淋巴结转移存在密切相关,通过检测血流参数有利于判断患者的淋巴结转移。

关键词: 甲状腺乳头状癌;淋巴结转移;血流参数;超声;诊断

中图分类号: R736.1; R445.1 **文献标识码:** A **文章编号:** 1673-6273(2020)08-1549-04

The Clinical Value of Ultrasonography in Diagnosis of Cervical Lymph Node Metastasis of Thyroid Papillary Carcinoma and the Correlation between Blood Flow Parameters and Lymph Node Metastasis*

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ABSTRACT Objective: To study the clinical value of ultrasonography in diagnosis of cervical lymph node metastasis of thyroid papillary carcinoma (PTC), and to analyze the correlation between blood flow parameters and lymph node metastasis. **Methods:** From January 2014 to September 2019, 78 patients with PTC who were treated in our hospital were selected for study. All subjects were divided into the metastatic group (42 cases) and the non-metastatic group (36 cases) according to cervical lymph node metastasis. The ultrasonographic image characteristics of the two groups were compared, and the sensitivity, specificity and accuracy of ultrasonographic diagnosis of PTC cervical lymph node metastasis were analyzed. In addition, the color doppler ultrasound blood flow parameters of the two groups were compared, the correlation between color doppler ultrasound blood flow parameters and lymph node metastasis was analyzed. **Results:** The proportion of lymphatic hilum and aspect ratio ≥ 2 in the metastatic group were lower than those in the non-metastatic group, while the proportion of calcification and cystic degeneration were higher than those in the non-metastatic group (all $P<0.05$). With pathological diagnosis as the gold standard, the sensitivity, specificity and accuracy of ultrasonic diagnosis of PTC cervical lymph node metastasis were 95.24%, 97.22% and 96.15%, respectively. There was no significant difference in acceleration time (AT) between the metastatic group and the non-metastatic group ($P>0.05$). Peak systolic velocity (PSV), pulsatility index (PI) and resistance index (RI) in the metastatic group were all higher than those in the non-metastatic group (all $P<0.05$). Pearson correlation analysis showed that PSV, PI and RI were positively correlated with lymph node metastasis (all $P<0.05$). **Conclusion:** Ultrasonography in diagnosis of PTC cervical lymph node metastasis is of high clinical value, and its blood flow parameters are closely related to lymph node metastasis. Detection of blood flow parameters is helpful to determine lymph node metastasis in patients with PTC.

Key words: Thyroid papillary carcinoma; Lymphatic node metastasis; Blood flow parameters; Ultrasound; Diagnosis

* 基金项目:安徽省科技公关基金资助项目(1704A0802171)

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(收稿日期:2019-10-22 接受日期:2019-11-17)

Chinese Library Classification(CLC): R736.1; R445.1 Document code: A

Article ID: 1673-6273(2020)08-1549-04

前言

甲状腺乳头状癌(Papillary thyroid carcinoma, PTC)属于临床上较为常见的一种恶性肿瘤,在所有甲状腺肿瘤中占比约为70%~80%,多见于女性人群^[1,2]。近年来 PTC 的发病率存在升高趋势^[3,4]。该类恶性肿瘤极易发生颈部淋巴结转移,而绝大部分患者无典型症状,部分患者经影像学检查结果显示为正常,加之部分淋巴结较小、解剖位置较深,从而增加了临床诊断的难度^[5,6]。由此可知,寻找一种可早期、准确诊断 PTC 淋巴结转移的检查手段,对于术前病情评估以及手术方案的选择具有极其重要的意义。超声是临床上应用较为广泛的影像学手段之一,目前已被广泛应用于多种恶性肿瘤的临床诊断中,具有一定的价值,且该影像学技术安全性及重复性均较好,且兼具价格低廉和操作简单的诸多优势,较易接受^[7-9]。其在术前有效观察 PTC 患者肿瘤情况的同时,可通过血流成像明确患者的血流情况,有利于评估 PTC 患者的淋巴结转移情况。鉴于此,本文通过研究超声诊断 PTC 颈部淋巴结转移的临床价值,分析其血流参数与淋巴结转移的相关性,旨在为临床诊断 PTC 颈部淋巴结转移提供资料支持,现作以下报道。

1 资料与方法

1.1 一般资料

选取 2014 年 1 月~2019 年 9 月,于我院接受诊治的 78 例 PTC 患者进行研究。纳入标准:(1)所有患者均经手术病理组织活检确诊为 PTC;(2)入院前未接受可能对本研究相关结果造成影响的治疗;(3)均为成年人;(4)临床病历资料完整。排除标准:(1)肝、肾、肺等重要脏器发生病变者;(2)心脑血管存在严重疾病者;(3)合并其他恶性肿瘤者;(4)意识障碍或无法沟通者。根据颈部淋巴结是否转移将所有研究对象分成转移组(42 例)和非转移组(36 例)。转移组男性 20 例,女性 22 例,年龄 33~78 岁,平均年龄(50.23±4.17)岁;病灶直径 0.4~4.6 cm,平均(1.45±0.27)cm;病变部位:单侧 31 例,双侧 11 例。非转移组男性 16 例,女性 20 例,年龄 34~79 岁,平均年龄(50.29±

4.25)岁;病灶直径 0.4~4.4cm,平均(1.44±0.33)cm;病变部位:单侧 26 例,双侧 10 例。两组上述指标比较,差异不显著($P>0.05$),可比性较好。本研究获得患者的知情同意以及医院伦理委员会批准。

1.2 研究方法

受试者均行超声检查,具体操作如下:所有患者均取仰卧位,使其颈部得以暴露,通过日立公司生产的彩超诊断仪实施血流成像的多普勒诊断,选择实时线阵型高频探头,其频率是 6~13MHz,并行淋巴结检查。记录以下指标:①淋巴结长径(L);②短径(S);③算出 L/S 值;而后对淋巴结的内淋巴门和钙化,及囊性变情况给予观察。针对肿瘤内部有血流信号者,选择 1 支粗大血管,算出:④收缩期加速时间(Acceleration time, AT);⑤收缩期峰值血流速度(Peak systolic velocity, PSV);⑥搏动指数(Pulsatility index, PI);⑦阻力指数(Resistance index, RI)。各项血流参数分别重复检测 3 次,将平均值作为最终结果。

1.3 评价标准

PTC 颈部淋巴结转移超声诊断判定标准^[10]:(1)淋巴结纵横比 <2 。(2)内部回声不均匀。(3)边界呈不规则,且周围包膜不清晰(和)或存在切迹。(4)淋巴结内存在微小钙化。

1.4 观察指标

比较超声声像图特征和彩色多普勒超声血流参数,分析超声诊断 PTC 颈部淋巴结转移的价值,分析彩超血流参数和淋巴结转移之间的相关性。

1.5 统计学方法

以 SPSS20.0 软件实施数据的分析,计数资料以[n(%)]表示,行 χ^2 检验;以($\bar{x}\pm s$)表示计量资料,行 t 检验。彩色多普勒超声血流参数与淋巴结转移的关系采用 Pearson 相关性分析。以 $P<0.05$ 说明差异有统计学意义。

2 结果

2.1 两组超声声像图特征对比

转移组淋巴门及纵横比 ≥ 2 人数占比低于非转移组,而钙化、囊性变人数占比高于非转移组(均 $P<0.05$)。见表 1。

表 1 两组超声声像图特征对比【例(%)】

Table 1 Comparison of ultrasonographic image characteristics between two groups[n(%)]

Groups	n	Lymphatic hilum	Calcification	Cystic degeneration	Aspect ratio ≥ 2
Metastatic group	42	1(2.38)	14(33.33)	11(26.19)	10(23.81)
Non-metastatic group	36	15(41.67)	1(2.78)	0(0.00)	24(66.67)
χ^2	-	18.349	11.652	10.977	14.480
P	-	0.000	0.001	0.001	0.000

2.2 超声诊断 PTC 颈部淋巴结转移结果和病理结果对比

以病理诊断为金标准,超声诊断 PTC 颈部淋巴结转移的灵敏度、特异度、准确度分别为 95.24%(40/42)、97.22%(35/36)、96.15%(75/78)。见表 2。

2.3 两组彩色多普勒超声血流参数对比

转移组与非转移组的 AT 对比不明显($P>0.05$);转移组 PSV、PI、RI 均高于非转移组(均 $P<0.05$)。见表 3。

2.4 彩色多普勒超声血流参数与淋巴结转移的相关性分析

经 Pearson 相关性分析可得:PSV、PI、RI 与淋巴结转移均呈正相关关系(均 $P<0.05$)。见表 4。

表 2 超声诊断 PTC 颈部淋巴转移结果和病理结果对比【例(%)】

Table 2 Comparison of ultrasonography in diagnosis of PTC neck lymphatic metastasis and pathological results[n(%)]

Inspection mode	Pathologic diagnosis			Total
		Positive	Negative	
Ultrasound	Positive	40	1	41
	Negative	2	35	37
	Total	42	36	78

表 3 两组彩色多普勒超声血流参数对比($\bar{x} \pm s$)Table 3 Comparison of blood flow parameters between two groups of color doppler ultrasound($\bar{x} \pm s$)

Groups	n	AT(ms)	PSV(cm/s)	PI	RI
Metastatic group	42	130.82± 25.19	45.41± 5.42	2.04± 0.51	0.80± 0.07
Non-metastatic group	36	136.48± 27.89	21.29± 4.73	1.33± 0.28	0.63± 0.05
t	-	0.942	20.766	7.442	12.150
P	-	0.349	0.000	0.000	0.000

表 4 彩色多普勒超声血流参数与淋巴结转移的相关性分析

Table 4 Correlation analysis between blood flow parameters of color doppler ultrasound and lymph node metastasis

Blood flow parameters	Lymph node metastasis	
	r	P
PSV	0.523	0.001
PI	0.508	0.004
RI	0.568	0.000

3 讨论

迄今为止,关于甲状腺癌发病机制并无统一标准,不少学者提出机体免疫、基因调控等因素可能参与了该病的发生、发展过程^[11-13]。相关研究数据表明,临床上典型的甲状腺癌 34.0%~64.1%会发生颈部淋巴结转移,因 PTC 具有分化程度高以及恶变程度低的特点,可通过手术根治,预后较为理想,患者的生存率较高^[14-16]。因此,术前对颈部淋巴结转移情况进行准确评估,对病情判断以及手术方案的制定具有极其重要的意义。目前,临床上主要是依靠术前触诊、彩色超声检查以及 CT 检查进行 PTC 颈部淋巴结转移的诊断,然而尚无统一标准^[17-19]。然而术前触诊受操作者主观因素影响较大,而 CT 会对患者造成一定程度的辐射损害,均存在局限性。

本文结果发现,转移组淋巴门及纵横比 ≥ 2 人数占比低于非转移组,而钙化、囊性变人数占比高于非转移组(均 $P<0.05$)。超声诊断 PTC 颈部淋巴转移的灵敏度、特异度、准确度分别为 95.24%、97.22%、96.15%。这与既往研究一致^[20],表明了超声诊断 PTC 颈部淋巴结转移的临床价值较高。分析原因,笔者认为当淋巴结表现特定形态后,血管走向通常具有不规则和扭曲等有关特点,进而使超声所探及的部分血流信号较为丰富,由此表明淋巴结转移具有较高的可能性。正常情况下,淋巴结纵横比 ≥ 2 ,并在彩色多普勒中显示为无血流信号或门型血流信号,而当肿瘤出现淋巴结转移时,会对淋巴结层次结构造成一定程度的破坏。继而导致淋巴结形态改变,致使超声表

现发生变化^[21-23]。此外,AT、PSV、RI、PI 分别是有效反映收缩期血流加速时间,收缩期峰值血流速度,血流阻力及灌注能力的有效指标^[24,25],本文结果表明,转移组与非转移组的 AT 对比不明显($P>0.05$);转移组 PSV、PI、RI 水平均高于非转移组(均 $P<0.05$)。其中杨增娣等人的研究报道显示^[26],老年 PTC 淋巴结转移患者的 PSV、PI、RI 水平相较于无淋巴结转移患者较高。提示了我们在临床工作中,可通过对上述血流参数指标水平进行检测,将有助于淋巴结转移的判断。究其原因,肿瘤形成淋巴结转移后,对于血流的需求增大,则易导致肿瘤内部的血流速度加快,从而使得 PSV 升高^[27-29]。随着淋巴结转移对于血流需求的增加,肿瘤新生血管相对活跃,继而导致了 PI 的升高。另外,新生动脉血管壁相对较薄,加之平滑肌不足,导致其在舒张期时无法确保有效舒张压,而癌细胞的破坏和瘤内淋巴网数目下降,致使瘤体静压上升,最终提升了 RI。另有研究报道证实^[30],肿瘤细胞的增殖会对血管造成局部压迫,促使其形成狭窄或闭塞,继而引起 RI 升高。经 Pearson 相关性分析可得:PSV、PI、RI 与淋巴结转移均呈正相关关系(均 $P<0.05$)。这充分证实了上述结果,表明了 PSV、PI、RI 水平的升高,可在一定程度上反映 PTC 颈部淋巴结转移的发生。

综上所述,超声应用于 PTC 颈部淋巴转移诊断中的临床价值较高,且其血流参数和淋巴结的转移有关,可用于判断患者发生淋巴结转移的重要指标,值得临床推广应用。

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