·临床研究·

强骨饮对股骨颈骨折患者人工股骨头置换术后假体周围骨密度的影响

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摘 要 **目的**：探讨强骨饮对股骨颈骨折患者人工股骨头置换术后假体周围骨密度的影响。**方法**：股骨颈骨折患者 78 例，按就诊顺序随机分为观察组和对照组，每组 39 例；2 组患者均进行人工股骨头置换术，术后分别采用口服钙尔奇 D 片和强骨饮及单纯口服钙尔奇 D 片进行干预。观察 2 组患者术后髋关节功能恢复情况；将人工假体柄周围分为 7 个区（R_1 ~ R_7），测量 2 组患者各区术后 1 周、术后 3 个月、术后 6 个月时假体周围的骨密度，并进行比较。**结果**：78 例患者均顺利完成手术，74 例获得随访，观察组失访 3 例，对照组失访 1 例；随访时间 9 ~ 24 个月，中位数 18.5 个月；患肢疼痛缓解、髋关节功能恢复。参照 Harris 髋关节评分标准对患肢髋关节进行评分，治疗组（87.5 ± 7.6）分，对照组（86.7 ± 8.1）分，2 组间差异无统计学意义（$t = 10.437$，$P = 0.896$）。均无假体松动等并发症发生。R_1 区，各时间点间骨密度值比较，差异有统计学意义（$F = 76.367$，$P = 0.000$），存在时间效应；2 组间骨密度值比较，差异有统计学意义（$F = 6.375$，$P = 0.001$），存在分组效应；术后 1 周，2 组间骨密度值比较，差异无统计学意义［（0.772 ± 0.214）g · cm^{-2}，（0.761 ± 0.178）g · cm^{-2}；$t = 0.578$，$P = 0.683$）；术后 3 个月、术后 6 个月，观察组骨密度值均高于对照组［（0.758 ± 0.268）g · cm^{-2}，（0.602 ± 0.244）g · cm^{-2}；$t = 2.232$，$P = 0.024$；（0.732 ± 0.227）g · cm^{-2}，（0.518 ± 0.188）g · cm^{-2}；$t = 2.847$，$P = 0.004$）］；时间因素和分组因素存在交互效应（$F = 36.726$，$P = 0.000$）。R_2 ~ R_6 区骨密度值［R_2：（1.532 ± 0.342）g · cm^{-2}，（1.478 ± 0.451）g · cm^{-2}，（1.432 ± 0.403）g · cm^{-2}；（1.613 ± 0.268）g · cm^{-2}，（1.582 ± 0.265）g · cm^{-2}，（1.533 ± 0.275）g · cm^{-2}。R_3：（1.746 ± 0.276）g · cm^{-2}，（1.641 ± 0.324）g · cm^{-2}，（1.615 ± 0.327）g · cm^{-2}；（1.692 ± 0.312）g · cm^{-2}，（1.634 ± 0.403）g · cm^{-2}，（1.589 ± 0.157）g · cm^{-2}。R_4：（1.831 ± 0.302）g · cm^{-2}，（1.768 ± 0.256）g · cm^{-2}，（1.711 ± 0.236）g · cm^{-2}；（1.798 ± 0.275）g · cm^{-2}，（1.735 ± 0.358）g · cm^{-2}，（1.636 ± 0.326）g · cm^{-2}。R_5：（1.736 ± 0.257）g · cm^{-2}，（1.677 ± 0.389）g · cm^{-2}，（1.632 ± 0.324）g · cm^{-2}；（1.812 ± 0.362）g · cm^{-2}，（1.752 ± 0.265）g · cm^{-2}，（1.698 ± 0.424）g · cm^{-2}。R_6：（1.563 ± 0.352）g · cm^{-2}，（1.612 ± 0.327）g · cm^{-2}，（1.578 ± 0.367）g · cm^{-2}；（1.642 ± 0.279）g · cm^{-2}，（1.598 ± 0.278）g · cm^{-2}（1.504 ± 0.276）g · cm^{-2}］各时间点间比较，差异均无统计学意义（$F = 2.468$，$P = 0.162$；$F = 1.569$，$P = 0.453$；$F = 1.862$，$P = 0.358$；$F = 3.556$，$P = 0.112$；$F = 4.065$，$P = 0.104$）；2 组间比较，差异均无统计学意义（$F = 1.679$，$P = 0.153$；$F = 0.879$，$P = 0.553$；$F = 2.568$，$P = 0.122$；$F = 3.512$，$P = 0.098$；$F = 4.679$，$P = 0.082$）；时间因素和分组因素存在交互效应（$F = 26.765$，$P = 0.000$；$F = 23.343$，$P = 0.000$；$F = 28.276$，$P = 0.000$；$F = 21.825$，$P = 0.000$；$F = 26.468$，$P = 0.000$）。R_7 区，各时间点间骨密度值比较，差异有统计学意义（$F = 52.828$，$P = 0.000$），存在时间效应；2 组间骨密度值比较，差异有统计学意义（$F = 12.476$，$P = 0.000$），存在分组效应；术后 1 周，2 组间骨密度值比较，差异无统计学意义［（1.292 ± 0.262）g · cm^{-2}，（1.203 ± 0.322）g · cm^{-2}；$t = 1.578$，$P = 0.167$］；术后 3 个月、术后 6 个月，观察组骨密度值均高于对照组［（1.178 ± 0.345）g · cm^{-2}，（0.869 ± 0.159）g · cm^{-2}；$t = 3.025$，$P = 0.002$；（1.123 ± 0.312）g · cm^{-2}，（0.752 ± 0.328）g · cm^{-2}；$t = 4.745$，$P = 0.000$］；时间因素和分组因素存在交互效应（$F = 32.478$，$P = 0.000$）。**结论**：强骨饮可增加股骨颈骨折患者人工股骨头置换术后股骨近端假体周围的骨密度。

关键词 关节成形术，置换，髋 骨密度 股骨颈骨折 手术后并发症 强骨饮

Effect of QIANGGU DRINK on peri-prosthetic bone density after artificial femoral head replacement in patients with femoral neck fractures

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ABSTRACT **Objective**：To study the effect of QIANGGU DRINK on peri-prosthetic bone density after artificial femoral head replacement

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in patients with femoral neck fractures. **Methods**: Seventy-eight patients with femoral neck fractures were randomly divided into observation group and control group according to the visit sequence, 39 cases in each group. All of the patients in the 2 groups were treated with artificial femoral head replacement, and then they were treated with oral application of caltrate D tablets combined with QIANGGU DRINK and monotherapy of oral application of caltrate D tablets respectively. Postoperative hip function restoration were reviewed and compared between the 2 groups. The areas around artificial prosthesis stem were divided into 7 zones ($R_1 \sim R_7$) and the bone density was measured in each zone and compared between the 2 groups at 1 week and 3 and 6 months after the surgery. **Results**: The surgery were performed successfully in all the patients and 74 patients were available for follow-up. Three patients lost to follow-up in observation group and one patient lost to follow-up in control group. The median follow-up period was 18.5 years (range, 9 - 24 months). The pain were relieved and the function of the hip joint were recovered in all the patients. The hip performance were evaluated according to the Harris Hip Score and the results showed that there was no statistical difference between the 2 groups (87.5 +/- 7.6 vs 86.7 +/- 8.1 points, $t = 10.437$, $P = 0.896$). No complications such as prosthesis loosening were found in the two groups. There was statistical difference in the bone density between different time points in R1 zone ($F = 76.367$, $P = 0.000$), in other words, there was time effect. There was statistical difference in the bone density between the 2 groups ($F = 6.375$, $P = 0.001$), in other words, there was group effect. There was no statistical difference in the bone density between the 2 groups one week after the surgery (0.772 +/- 0.214 vs 0.761 +/- 0.178 g/cm(2); $t = 0.578$, $P = 0.683$). The bone density of observation group were higher than those of control group 3 and 6 months after the surgery (0.758 +/- 0.268 vs 0.602 +/- 0.244 g/cm(2); $t = 2.232$, $P = 0.024$; 0.732 +/- 0.227 vs 0.518 +/- 0.188 g/cm(2); $t = 2.847$, $P = 0.004$). There was interaction between time factor and grouping factor ($F = 36.726$, $P = 0.000$). There was no statistical difference in the bone density of $R_2 \sim R_6$ zones (R_2: 1.532 +/- 0.342, 1.478 +/- 0.451, 1.432 +/- 0.403 g/cm(2); 1.613 +/- 0.268, 1.582 +/- 0.265, 1.533 +/- 0.275 g/cm(2). R_3: 1.746 +/- 0.276, 1.641 +/- 0.324, 1.615 +/- 0.327 g · cm(2); 1.692 +/- 0.312, 1.634 +/- 0.403, 1.589 +/- 0.157 g/cm(2). R_4: 1.831 +/- 0.302, 1.768 +/- 0.256, 1.711 +/- 0.236 g/cm(2); 1.798 +/- 0.275, 1.735 +/ - 0.358, 1.636 +/- 0.326 g/cm(2). R_5: 1.736 +/- 0.257, 1.677 +/- 0.389, 1.632 +/- 0.324 g/cm(2); 1.812 +/- 0.362, 1.752 +/- 0.265, 1.698 +/- 0.424 g/cm(2). R_6: 1.563 +/- 0.352, 1.612 +/- 0.327, 1.578 +/- 0.367 g/cm(2); 1.642 +/ - 0.279, 1.598 +/- 0.278, 1.504 +/- 0.276 g/cm(2)) between different time points ($F = 2.468$, $P = 0.162$; $F = 1.569$, $P = 0.453$; $F = 1.862$, $P = 0.358$; $F = 3.556$, $P = 0.112$; $F = 4.065$, $P = 0.104$). There was no statistical difference in the bone density between the 2 groups ($F = 1.679$, $P = 0.153$; $F = 0.879$, $P = 0.553$; $F = 2.568$, $P = 0.122$; $F = 3.512$, $P = 0.098$; $F = 4.679$, $P = 0.082$). There was interaction between time factor and grouping factor ($F = 26.765$, $P = 0.000$; $F = 23.343$, $P = 0.000$; $F = 28.276$, $P = 0.000$; $F = 21.825$, $P = 0.000$; $F = 26.468$, $P = 0.000$). There was statistical difference in the bone density between different time points in R_7 zone ($F = 52.828$, $P = 0.000$), in other words, there was time effect. There was statistical difference in the bone density between the 2 groups ($F = 12.476$, $P = 0.000$), in other words, there was grouping effect. There was no statistical difference in the bone density between the 2 groups at one week after the surgery (1.292 +/- 0.262 vs 1.203 +/- 0.322 g/cm(2); $t = 1.578$, $P = 0.167$). The bone density of observation group were higher than those of control group at three and six months after the surgery (1.178 +/- 0.345 vs 0.869 +/- 0.159 g/cm(2); $t = 3.025$, $P = 0.002$; 1.123 +/- 0.312 vs 0.752 +/- 0.328 g/cm(2); $t = 4.745$, $P = 0.000$). There was interaction between time factor and grouping factor ($F = 32.478$, $P = 0.000$). **Conclusion**: QIANGGU DRINK can increase proximal femoral peri-prosthetic bone density after artificial femoral head replacement in patients with femoral neck fractures.

Key words　Arthroplasty, replacement, hip; Bone density; Femoral neck fractures; Postoperative complications; QIANGGU DRINK

人工股骨头置换术用于股骨头坏死终末期和老年股骨颈骨折的治疗，可明显改善患者的生活质量。但术后因假体周围骨溶解和骨丢失并发假体松动的风险不容忽视[1-3]。临床研究[4-5]表明强骨饮具有增强成骨细胞活性，抑制破骨细胞活性，增加骨密度（bone mineral density，BMD）的作用。2009 年 1 月至 2013 年 3 月，笔者分别采用口服钙尔奇 D 片和强骨饮及单纯口服钙尔奇 D 片 2 种方法，对 78 例人工股骨头置换术后的股骨颈骨折患者进行干预，并对 2 组患者术后假体周围 BMD 进行比较，以探讨强骨饮对人工股骨头置换术后假体周围 BMD 的影响，现报告如下。

1　临床资料

1.1　一般资料　股骨颈骨折患者 78 例，男 44 例，女 34 例，年龄 65 ~ 93 岁，中位数 75.5 岁；左侧 42 例，右侧 36 例。

1.2　纳入标准　①髋部正侧位 X 线片明确显示股骨颈骨折，且骨折为头下型；②年龄≥65 岁；③签署知情同意书。

1.3　排除标准　①合并严重的心、肺、肝、肾等功能障碍者；②合并严重的糖尿病者；③合并髋关节化脓

性关节炎、骨髓炎或髋关节结核者；④合并髋臼骨折或髋臼退变明显者；⑤长期应用激素或最近 6 个月曾接受过抗骨质疏松药物治疗者。

2 方 法

2.1 分组方法 共纳入 78 例患者，按就诊顺序随机分为观察组和对照组，每组 39 例。

2.2 手术方法 手术均由同一组医生完成，取髋关节后外侧改良 Gibson 切口，均使用钴铬钼合金生物型人工假体。

2.3 术后处理 ①观察组：除常规处理外，术后 1 周开始口服钙尔奇 D 片 600 mg，每日 1 次，共用 15 周；强骨饮（鹿角霜 20 g、忍冬藤 25 g、鸡血藤 25 g、秦艽 15 g、防风 15 g、蜂房 20 g、肉桂 10 g、川芎 20 g、黄芪 30 g 等，由浙江中医药大学附属第二医院中药房煎制）150 mL，每日早、晚各 1 次，口服，3 周为 1 个疗程，共用 5 个疗程，每个疗程间隔 2 周。②对照组：除常规处理外，术后 1 周开始口服钙尔奇 D 片 600 mg，每日 1 次，共用 15 周。

2.4 BMD 测量方法 参照 Gruen 法[6]将假体周围分为 7 个区（region of interest，ROI），即患者仰卧位，患肢内旋 12°，髌骨保持在中立位，将大转子至人工假体柄远端等分为 3 份，外侧从上到下分别为 R_1、R_2、R_3，内侧从下到上分别为 R_5、R_6 和 R_7，假体柄远端以下 2 cm 内为 R_4（图 1）。分别在术后 1 周、3 个月及 6 个月采用 OSTEOCORE 双能 X 线骨密度仪检测患肢假体周围 BMD。

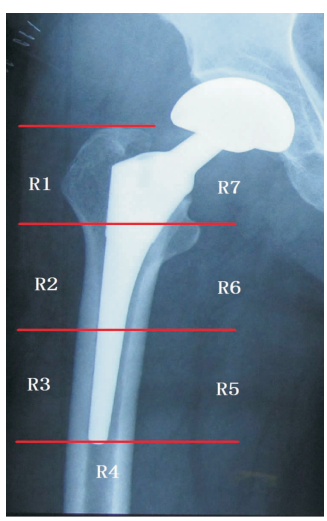

图 1 人工股骨头置换术后假体周围骨密度测量区

2.5 统计学方法 采用 SPSS16.0 统计软件处理数据，2 组患者性别、病变部位的组间比较采用 χ^2 检验；2 组患者年龄和患肢髋关节评分的组间比较采用 t 检验；2 组患者各测量区不同时间点 BMD 值的比较采用重复测量数据的方差分析；检验水准 $\alpha = 0.05$。

3 结 果

3.1 分组结果 2 组患者基线资料比较，差异无统计学意义，具有可比性（表 1）。

表 1 2 组人工股骨头置换术后患者基线资料比较

组别	性别（例）		年龄（岁）	病变部位（例）	
	男	女		左侧	右侧
观察组	21	18	75.45 ± 3.46	22	17
对照组	23	16	73.06 ± 3.15	20	19
检验统计量	$\chi^2 = 0.209$		$t = -0.578$	$\chi^2 = 0.206$	
P 值	0.648		0.348	0.650	

3.2 治疗结果 78 例患者均顺利完成手术，74 例获得随访，观察组失访 3 例，对照组失访 1 例；随访时间 9 ~ 24 个月，中位数 18.5 个月；患肢疼痛缓解、髋关节功能恢复；参照 Harris 髋关节评分标准[7]对患肢髋关节进行评分，治疗组（87.5 ± 7.6）分，对照组（86.7 ± 8.1）分，2 组间差异无统计学意义（$t = 10.437$，$P = 0.896$）。均无假体松动等并发症发生。

3.3 假体周围 BMD 值测量结果 R_1 区，各时间点间 BMD 值比较，差异有统计学意义（$F = 76.367$，$P = 0.000$），存在时间效应；2 组间 BMD 值比较，差异有统计学意义（$F = 6.375$，$P = 0.001$），存在分组效应；术后 1 周，2 组间 BMD 值比较，差异无统计学意义（$t = 0.578$，$P = 0.683$）；术后 3 个月、术后 6 个月，观察组 BMD 值均高于对照组（$t = 2.232$，$P = 0.024$；$t = 2.847$，$P = 0.004$）；时间因素和分组因素存在交互效应（$F = 36.726$，$P = 0.000$）。R_2 ~ R_6 区，各时间点间 BMD 值比较，差异均无统计学意义（$F = 2.468$，$P = 0.162$；$F = 1.569$，$P = 0.453$；$F = 1.862$，$P = 0.358$；$F = 3.556$，$P = 0.112$；$F = 4.065$，$P = 0.104$）；2 组间 BMD 值比较，差异均无统计学意义（$F = 1.679$，$P = 0.153$；$F = 0.879$，$P = 0.553$；$F = 2.568$，$P = 0.122$；$F = 3.512$，$P = 0.098$；$F = 4.679$，$P = 0.082$）；时间因素和分组因素存在交互效应（$F = 26.765$，$P = 0.000$；$F = 23.343$，$P = 0.000$；$F = 28.276$，$P = 0.000$；$F = 21.825$，$P = 0.000$；$F = 26.468$，$P = 0.000$）。R_7 区，各时间点间 BMD 值比较，差异有统计学意义（$F = 52.828$，$P = 0.000$），存在时间效应；2 组间 BMD 值比较，差异有统计学意义（$F = 12.476$，$P = 0.000$），存在分组效应；术后 1 周，2 组间 BMD 值比较，差异无统计学意义（$t = 1.578$，$P = 0.167$）；术后 3 个月、术后 6 个

月,观察组 BMD 值均高于对照组($t = 3.025$, $P = 0.002$;$t = 4.745$, $P = 0.000$);时间因素和分组因素存在交互效应($F = 32.478$, $P = 0.000$)。见表 2。

表 2　2 组人工股骨头置换术后患者不同测量区各时间点骨密度

组别	目的区	骨密度($g \cdot cm^{-2}$)		
		术后 1 周	术后 3 个月	术后 6 个月
观察组	R_1	0.772 ± 0.214	0.758 ± 0.268	0.732 ± 0.227
	R_2	1.532 ± 0.342	1.478 ± 0.451	1.432 ± 0.403
	R_3	1.746 ± 0.276	1.641 ± 0.324	1.615 ± 0.327
	R_4	1.831 ± 0.302	1.768 ± 0.256	1.711 ± 0.236
	R_5	1.736 ± 0.257	1.677 ± 0.389	1.632 ± 0.324
	R_6	1.563 ± 0.352	1.612 ± 0.327	1.578 ± 0.367
	R_7	1.292 ± 0.262	1.178 ± 0.345	1.123 ± 0.312
对照组	R_1	0.761 ± 0.178	0.602 ± 0.244	0.518 ± 0.188
	R_2	1.613 ± 0.268	1.582 ± 0.265	1.533 ± 0.275
	R_3	1.692 ± 0.312	1.634 ± 0.403	1.589 ± 0.157
	R_4	1.798 ± 0.275	1.735 ± 0.358	1.636 ± 0.326
	R_5	1.812 ± 0.362	1.752 ± 0.265	1.698 ± 0.424
	R_6	1.642 ± 0.279	1.598 ± 0.278	1.504 ± 0.276
	R_7	1.203 ± 0.322	0.869 ± 0.159	0.752 ± 0.328

4　讨　论

人工股骨头置换术后,假体柄植入髓腔会改变股骨原有的生物力学结构,使假体周围存在一定的应力遮挡,导致局部骨代谢紊乱、骨量丢失。Mulcahy 等[8]的研究表明,约 20% 接受全髋关节置换术的患者假体周围存在不同程度的骨溶解。但只有假体周围骨量丢失达到 70% 左右时,在 X 线片上才可见假体边缘透亮影,X 线检查不能反映人工关节置换术后早期假体周围骨溶解、骨丢失的情况[9-11]。Gallinaro 等[12]在进行一项长期随访研究后,认为双能 X 线吸收测量法是人工髋关节置换术后观察假体周围骨组织变化最理想的方法。

强骨饮方中,黄芪与鹿角霜共为君药,有益气补肾、补髓壮骨之效;川芎、鸡血藤、忍冬藤、秦艽、蜂房、肉桂共为臣药,以温经通络,补血行血,通络以助气行;防风为佐使药,通达内外,使益气补肾而不滞,温经通络而不散;全方共奏益气补肾,温经通络之效。研究[4-5,13]表明强骨饮可改善关节内微循环,改善骨吸收与骨形成偶联失衡状况,抑制骨吸收,改善骨形态计量学指标。因此,本研究中观察组术后应用钙尔奇 D 片联合强骨饮进行干预,术后 3 个月和 6 个月时 R_1 和 R_7 的 BMD 值均较单纯应用钙尔奇 D 片干预的对照组高,很可能是由于强骨饮促进成骨细胞增殖、抑制骨吸收的作用,增加了股骨近端假体周围的骨密度。

本研究结果表明,强骨饮可增加股骨颈骨折患者人工股骨头置换术后股骨近端假体周围的骨密度,但强骨饮能否防止人工假体的无菌性松动,从而延长假体的使用寿命,还有待进一步研究。

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