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子宫动脉化疗栓塞与单子宫动脉栓塞在瘢痕妊娠治疗有效性对比 *

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摘要 目的:对比子宫动脉化疗栓塞与单子宫动脉栓塞在瘢痕妊娠治疗中的有效性。**方法:**选择 2016 年 1 月-2018 年 12 月在我院诊治的瘢痕妊娠患者 96 例,根据手术方式不同分为两组,各 48 例,其中,对照组采用单子宫动脉栓塞治疗,研究组采用子宫动脉化疗栓塞治疗,记录并对比两组术中出血量、手术时间、住院时间、人绒毛膜促性腺激素 β 亚单位(human chorionic gonadotropin (h)in-beta subunit, β -HCG)下降至正常范围时间、宫腔异常包块消失时间、月经恢复正常时间、首次肛门排气时间等指标;记录并对比两组患者治疗前后的卵泡刺激素(follicle stimulating hormone, FSH)、黄体生成素(luteinizing hormone, LH)、雌二醇(estradiol, E2)、抑制素 B(inhibin B, INHB)等卵巢功能指标变化;记录并对比两组的膀胱损伤、阴道流血、感染等术后并发症的发生情况。**结果:**研究组的术中出血量、手术时间、住院时间均显著少于(短于)对照组($P<0.05$);研究组的 β -HCG 下降至正常范围时间、宫腔异常包块消失时间、月经恢复正常时间、首次肛门排气时间均显著短于对照组($P<0.05$);治疗前,两组的 FSH、LH、E2、INHB 等卵巢功能指标对比均无显著性差异($P>0.05$);治疗后,两组的 FSH 水平均升高, LH、E2、INHB 水平均降低,且研究组更优($P<0.05$);研究组的并发症发生率显著低于对照组(6.25 % vs. 20.83 %, $P<0.05$)。**结论:**相比于单子宫动脉栓塞,子宫动脉化疗栓塞有利于改善瘢痕妊娠患者的手术相关指标及术后恢复情况,对患者卵巢功能的恢复较好,且安全性较高,值得推荐至临床广泛应用。

关键词:子宫动脉化疗栓塞;单子宫动脉栓塞;瘢痕妊娠;卵巢功能

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Comparison of the Effectiveness of Uterine Artery Chemoembolization and Single Uterine Artery Embolization in the Treatment of Scar Pregnancy*

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ABSTRACT Objective: To compare the effectiveness of uterine artery chemoembolization and single uterine artery embolization in the treatment of scar pregnancy. **Methods:** A total of 96 patients with scar pregnancy diagnosed and treated in our hospital from January 2016 to December 2018 were selected as study subjects. According to the different surgical methods, they were divided into two groups, with 48 patients. Among them, patients in the control group were treated with single uterine artery embolization, and patients in the study group were treated with uterine artery chemoembolization. Record and compare the intraoperative bleeding volume, operation time, length of hospital stay, time for β -HCG to fall to normal range, time for abnormal mass loss of uterine cavity, time for menstrual recovery to normal, time for first anal exhaust. Changes in ovarian function indexes such as FSH, LH, E2, INHB before and after treatment were recorded and compared between the two groups of patients; postoperative complications such as bladder injury, vaginal bleeding, and infection were recorded and compared between the two groups. **Results:** The intraoperative blood loss, operation time, and hospital stay of the study group were significantly less (shorter) than those of the control group ($P<0.05$). The time of β -HCG decline to normal range, the time of disappearance of abnormal uterine mass, the time of normal menstruation, and the time of first anal exhaust were significantly shorter in the study group than in the control group ($P<0.05$). Pretherapy, there was no significant difference in FSH, LH, E2, INHB and other ovarian function indicators between the two groups of patients ($P>0.05$). Post-treatment, the levels of FSH in the two groups increased, and the levels of LH, E2, and INHB decreased, and the study group was better ($P<0.05$). The incidence of complications in the study group was significantly lower than that in the control group (6.25 % vs. 20.83 %, $P<0.05$). **Conclusion:** Compared with single uterine arterial embolization, uterine arterial chemoembolization is beneficial to improve the surgical related indexes and postoperative recovery of patients with scar pregnancy.

Key words: Uterine arterial chemoembolization; Single uterine arterial embolization; Scar pregnancy; Ovarian function

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前言

瘢痕妊娠指孕囊、胚胎着床于剖宫产后子宫瘢痕处,属于异位妊娠的一种,因此一旦早孕期确诊了瘢痕妊娠,一般建议尽早流产^[1],如果瘢痕妊娠向前突出明显,突向膀胱侧时不能进行正常人流,需选择开腹或者腹腔镜手术将膀胱分开,显露孕囊,将孕囊完整切除^[23]。如果瘢痕妊娠向宫腔内突出,需先进行子宫动脉栓塞,后做人工流产,且流产中要小心大出血的可能性^[45]。目前没有统一的治疗方法,临床上多采用个性化综合治疗。子宫动脉栓塞是妇科栓塞中的一种,是指在医学影像的引导下,用栓塞剂定向栓塞子宫的动脉,人为的切断病灶的血液循环和营养供给,从而达到治疗的目的^[68],可用于治疗产后出血、子宫肌瘤、前置胎盘、特殊类型异位妊娠、子宫腺肌症、妊娠滋养细胞疾病、宫颈癌等妇科疾病^[9]。子宫动脉化疗栓塞是指在子宫动脉栓塞基础上注入适量甲氨蝶呤的治疗方法^[10]。本文通过对比子宫动脉化疗栓塞与单子宫动脉栓塞在瘢痕妊娠治疗中的有效性,旨在为临床治疗瘢痕妊娠提供依据。

1 资料与方法

1.1 一般资料

选择 2016 年 1 月~2018 年 12 月在我院诊治的瘢痕妊娠患者 96 例,根据手术方式不同分为研究组和对照组,每组各 48 例,其中,研究组患者年龄在 24-36 岁之间,平均年龄为 27.83 ± 4.15 岁,停经时间在 37-60 d 之间,平均停经时间为 47.33 ± 7.14 d,距离上次剖宫产时间在 0.7-10 年之间,平均时间为 4.87 ± 1.35 年;对照组患者年龄在 23-36 岁之间,平均年龄为 27.51 ± 4.33 岁,停经时间在 37-61 d 之间,平均停经时间为 47.57 ± 7.05 d,距离上次剖宫产时间在 0.9-10 年之间,平均时间为 4.92 ± 1.32 年;两组的一般资料经统计学比较,无显著性差异($P > 0.05$)。本研究获得本院伦理委员会同意,患者均知情同意。

1.2 纳入和排除标准

纳入标准:(1)符合瘢痕妊娠诊断标准,并经影像学检查确诊者;(2)近期未使用过甾体类激素者;(3)临床资料完整,且能全程配合本次研究者。排除标准:(1)存在心脑血管疾病者;(2)合并严重肝肾功能不全症状者;(3)对本次研究所用药物过敏者;(4)存在内分泌系统疾病者。

1.3 治疗方法

对照组采用单子宫动脉栓塞治疗,具体方法如下:对患者实施局部麻醉后,从右股动脉穿刺插管至腹部主动脉,通过血管造影机显示两侧子宫动脉,分别将明胶海绵颗粒栓塞到两侧子宫动脉,且造影确认已闭塞,术后 1-3 d 内进行清宫术。研究组:在对照组基础上,通过微导管灌注 50 mg 甲氨蝶呤(澳大利亚 Pfizer (Perth) Pty Limited,注册证号 H20090207,规格:20 mL:0.5 g)。两组术后均随访 3 个月。

1.4 观察指标

(1)对比两组术中出血量、手术时间、住院时间;(2)对比两组的 β -HCG 下降至正常范围时间、宫腔异常包块消失时间、月经恢复正常时间、首次肛门排气时间等指标^[11];(3)对比两组治疗前后的 FSH、LH、E2、INHB 等卵巢功能指标变化^[12];(4)对比两组膀胱损伤、阴道流血、感染等术后并发症情况^[13]。

1.5 统计学分析

采用 SPSS 20.0,计量资料以($\bar{x} \pm s$)示,行 t 检验;计数资料以%示,行 χ^2 检验。 $P < 0.05$ 有统计学意义。

2 结果

2.1 手术情况对比

研究组术中出血量显著少于对照组($t=45.487, P=0.000$),研究组手术时间、住院时间均显著短于对照组($t=42.867, P=0.000$; $t=6.441, P=0.000$),两组比较均存在统计学意义($P < 0.05$),见表 1。

表 1 手术情况对比($\bar{x} \pm s$)

Table 1 Comparison of surgical conditions($\bar{x} \pm s$)

Groups	n	Intraoperative blood loss (mL)	Operation time (min)	Length of stay (d)
Research group	48	$50.61 \pm 5.34^*$	$15.42 \pm 1.36^*$	$5.12 \pm 1.24^*$
Control group	48	208.64 ± 23.47	28.46 ± 1.61	6.98 ± 1.57

Note: Compared with the control group, $*P < 0.05$.

2.2 术后恢复情况对比

研究组的 β -HCG 下降至正常范围时间、宫腔异常包块消失时间、月经恢复正常时间、首次肛门排气时间均短于对照组

($t=13.376, P=0.000$; $t=11.762, P=0.000$; $t=11.545, P=0.000$; $t=4.079, P=0.000$),两组比较有统计学意义($P < 0.05$),见表 2。

表 2 术后恢复情况对比($\bar{x} \pm s$)

Table 2 Comparison of postoperative recovery($\bar{x} \pm s$)

Groups	n	Beta-HCG fall to normal range time (d)	Disappearing time of abnormal mass of uterine cavity (d)	Menstruation returns to normal time (d)	First anal exhaust time (h)
Research group	48	$22.14 \pm 5.65^*$	$40.25 \pm 5.16^*$	$35.84 \pm 6.14^*$	$28.54 \pm 6.32^*$
Control group	48	39.87 ± 7.24	53.48 ± 5.84	50.68 ± 6.45	34.15 ± 7.13

Note: Compared with the control group, $*P < 0.05$.

2.3 卵巢功能对比

治疗前, 两组 FSH、LH、E2、INHB 等卵巢功能指标对比均无显著性差异($P>0.05$); 治疗后, 两组 FSH 水平均升高, LH、

E2、INHB 水平均降低, 且研究组变化较对照组更优($P<0.05$), 见表 3。

表 3 卵巢功能对比($\bar{x} \pm s$)
Table 3 Comparison of ovarian function($\bar{x} \pm s$)

Groups	Time	FSH (U/L)	LH (U/L)	E2 (pmol/L)	INHB (pg/ml)
Research group	Pretherapy	3.15± 1.05	7.65± 1.85	260.48± 42.15	96.76± 10.23
	Post-treatment	4.63± 1.52* [#]	6.48± 1.02* [#]	242.01± 40.34* [#]	90.11± 8.78* [#]
Control group	Pretherapy	3.18± 1.01	7.69± 1.77	259.11± 43.68	96.85± 11.02
	Post-treatment	3.91± 1.37*	7.05± 1.32*	251.03± 40.89*	93.16± 10.07*

Note: Compared with pretherapy, * $P<0.05$; compared with control group post-treatment, [#] $P<0.05$.

2.4 并发症发生情况对比

研究组的并发症发生率 6.25 %, 显著低于对照组 20.83 %

($\chi^2=4.36, P=0.037$), 两组对比有统计学意义($P<0.05$), 见表 4。

表 4 并发症发生情况对比[例(%)]
Table 4 Comparison of complications [n (%)]

Groups	n	Bladder injury	Vaginal bleeding	infection	Shoulder pain	Complication rate
Research group	48	1 (2.08)	1 (2.08)	1 (2.08)	0 (0.00)	3 (6.25)*
Control group	48	2 (4.16)	2 (4.17)	3 (6.25)	3 (6.25)	10 (20.83)

Note: Compared with the control group, * $P<0.05$.

3 讨论

子宫瘢痕妊娠属于异位妊娠的一种表现方式, 由于在受精卵着床的时候一部分着床在子宫瘢痕处, 一部分在宫腔内, 所以没有办法继续妊娠^[14-16], 必须要通过终止妊娠的手术方式来达到治疗的目的, 不然随着孕囊不停的增大可以造成子宫瘢痕处破裂, 会引起大出血的几率发生^[17-19]。由于子宫切口瘢痕处周围具有充分的血液供应, 故宫腔镜下的子宫瘢痕妊娠手术, 首先要行子宫动脉栓塞术, 子宫动脉栓塞之后, 再考虑行人工流产^[20-22]。

子宫动脉栓塞术是由于子宫动脉出血通过其他的手段不能够有效止血, 或者是止血的风险较大, 只能选择在介入手术的情况下做动脉栓塞术来起到止血的作用^[23]。动脉介入化疗是用导管技术将化疗药物直接灌注到孕囊, 因此动脉灌注化疗可有效克服经静脉药物化疗的缺点, 同时患者全身药物浓度较低, 减轻化疗药物不良反应^[24,25]。本文研究结果显示, 研究组的术中出血量、手术时间、住院时间均显著少于(短于)对照组; 研究组的 β -HCG 下降至正常范围时间、宫腔异常包块消失时间、月经恢复正常时间、首次肛门排气时间均显著短于对照组; 表明, 相比于子宫动脉栓塞, 子宫动脉化疗栓塞有利于改善瘢痕妊娠患者的手术相关指标及术后恢复情况。这与 Zhang W^[26]等人研究类似, 通过子宫动脉栓塞术治疗剖宫产疤痕妊娠的疗效研究, 发现子宫动脉栓塞术治疗疤痕妊娠具有良好的疗效和安全性, 均达到了保护子宫和生育的目的。主要原因可能为子宫动脉栓塞术中的甲氨蝶呤具有化疗杀伤和缺血损伤的双重作用, 促进卵巢能够合成和分泌雌、孕、雄等激素, 这些激素相互拮抗、相互依赖, 从而使女性生理功能达到自动调节的状态

^[27,28]。本文研究结果显示, 治疗前, 两组的 FSH、LH、E2、INHB 等卵巢功能指标对比均无显著性差异; 治疗后, 两组的 FSH 水平均升高, LH、E2、INHB 水平均降低, 且研究组更优; 表明, 相比于子宫动脉栓塞, 子宫动脉化疗栓塞有利于瘢痕妊娠患者患者卵巢功能的恢复。这与王彩荣^[29]对瘢痕妊娠患者应用子宫动脉化疗栓塞与子宫动脉栓塞方案研究有不同之处, 她发现采用子宫动脉化疗栓塞和子宫动脉栓塞, FSH、LH、E2、INHB 水平相差不大, 分析主要可能与患者的个体差异有关, 在后期需要增加样本点来源, 进行进一步的比较。

子宫动脉栓塞术后由于子宫血流阻断, 局部组织缺血、坏死, 部分患者会出现不适的症状, 比如出现下腹痛、发热、不规则阴道出血或者阴道分泌物增加、恶心呕吐、等不适症状^[30,31], 本文研究研究组并发症发生率显著低于对照组; 表明, 相比于子宫动脉栓塞, 子宫动脉化疗栓塞治疗瘢痕妊娠的安全性较高。但李奎^[32]等人的研究发现主要的并发症有药物性肝损伤, 轻度发热, 轻微盆腔疼痛等, 在对症治疗后均好转, 与本研究类似, 分析其原因可能为: 局部给予甲氨蝶呤具有起效快, 延长杀胚时间, 促进了滋养细胞的死亡, 降低了术中出血的风险, 从而降低并发症的发生。本研究也存在一定的不足, 样本量少, 来源单一, 结果可能存在一定的偏移, 在后续研究中需要进一步扩大样本量研究。

综上所述, 相比于子宫动脉栓塞, 子宫动脉化疗栓塞有利于改善瘢痕妊娠患者的手术相关指标及术后恢复情况, 对患者卵巢功能的恢复较好, 且安全性较高, 值得推荐至临床广泛应用。

参考文献(References)

- [1] Wang YJ, Zhai Y, Zhang ZY. Clinical features and outcome of cesare-

- an scar pregnancy [J]. *Zhonghua Yi Xue Za Zhi*, 2017, 97(13): 986-990
- [2] Li-Ping Fu. Therapeutic approach for the cesarean scar pregnancy[J]. *Medicine*, 2018, 97(18): e0476
- [3] Giampaolino P, Della Corte L, Venetucci P, et al. Treatment of asymptomatic uterine rupture of caesarean scar pregnancy in patient with advanced gestational age: case report [J]. *J Obstet Gynaecol*, 2017, 38(4): 1-2
- [4] Zhang W, Hou B, Xu H, et al. Efficacy of uterine artery chemoembolization in treatment of cesarean scar pregnancy[J]. *Chinese Journal of Interventional Imaging & Therapy*, 2017, 14(1): 13-17
- [5] Kim AY, Frantz S, Krishnan P, et al. Short-term imaging response after drug-eluting embolic trans-arterial chemoembolization delivered with the Surefire Infusion System for the treatment of hepatocellular carcinoma[J]. *PLoS One*, 2017, 12(9): e0183861
- [6] Fang XY, Hu LH, Hang YP, et al. Polymicrobial bacteremia after treatment of transcatheter arterial chemoembolization: A case report[J]. *Medicine*, 2019, 98(40): e17393
- [7] Zhang W, Hou B, Xu H, et al. Efficacy of uterine artery chemoembolization in treatment of cesarean scar pregnancy[J]. *Chinese Journal of Interventional Imaging & Therapy*, 2017, 14(1): 13-17
- [8] Tumenjargal A, Tokue H, Kishi H, et al. Uterine Artery Embolization Combined with Dilation and Curettage for the Treatment of Cesarean Scar Pregnancy: Efficacy and Future Fertility[J]. *Cardiovasc Intervent Radiol*, 2018, 41(8): 1165-1173
- [9] Baranov A, Salvesen KÅ, Vikhareva O. Assessment of Cesarean hysterotomy scar before pregnancy and at 11-14 weeks of gestation: a prospective cohort study[J]. *Ultrasound Obstet Gynecol*, 2017, 50(1): 105-109
- [10] Lee TY, Lin CC, Chen CY, et al. Combination of transcatheter arterial chemoembolization and interrupted dosing sorafenib improves patient survival in early-intermediate stage hepatocellular carcinoma: A post hoc analysis of the START trial[J]. *Medicine*, 2017, 96(37): e7655
- [11] Elsirgany S, Elsheikhah AZ, Rammah A, et al. EP23.22: Case report: conservative surgical management of Cesarean scar pregnancy at 14 weeks of gestational age[J]. *Ultrasound in Obstetrics and Gynecology*, 2019, 54(S1): 390-390
- [12] Seah SC, Laili SAL, Hairiah A, et al. Catching an ectopic caesarean scar pregnancy - Radiological perspective [J]. *Med J Malaysia*, 2018, 73(1): 51-53
- [13] Ravi Selvaraj L, Rose N, Ramachandran M. Pitfalls in Ultrasound Diagnosis of Cesarean Scar Pregnancy [J]. *J Obstet Gynaecol India*, 2018, 68(3): 164-172
- [14] Takeshi Hatanaka, Hirotaka Arai, Satoru Kakizaki. Balloon-occluded transcatheter arterial chemoembolization for hepatocellular carcinoma [J]. *World J Hepatology*, 2018, 10(7): 485-495
- [15] Yang K, Wang XW, Zhao L, et al. Effect of radiofrequency ablation combined with transcatheter arterial chemoembolization on inflammatory factors, oxidative stress response factors and tumor activity factors in patients with primary liver cancer [J]. *Journal of Hainan Medical University*, 2017, 23(4): 112-116
- [16] Lee M, Jin WC, Lee KH, et al. Korean Multicenter Registry of Transcatheter Arterial Chemoembolization with Drug-Eluting Embolic Agents for Nodular Hepatocellular Carcinomas: Six-Month Outcome Analysis[J]. *J Vasc Interv Radiol*, 2017, 28(4): 502-512
- [17] Shi M, Zhang H, Qi SS, et al. Identifying risk factors for cesarean scar pregnancy: A retrospective study of 79 cases [J]. *Ginekol Pol*, 2018, 89(4): 195-199
- [18] Wei LK, Yu LM, Mu RM, et al. Reproductive outcomes following women with previous cesarean scar pregnancy [J]. *Zhonghua Yi Xue Za Zhi*, 2018, 98(27): 2194-2197
- [19] Zhao L, Yang H, Ma BR, et al. Comparison of hysteroscopy and curettage in incomplete pregnancy with cesarean scar pregnancy[J]. *Zhonghua Yi Xue Za Zhi*, 2018, 98(3): 217-221
- [20] Li W, Yang XG, Xu GH, et al. Clinical effect of transcatheter arterial chemoembolization combined with recombinant human endostatin in treatment of primary liver cancer with portal vein tumor thrombus[J]. *Zhonghua Gan Zang Bing Za Zhi*, 2017, 25(3): 226-228
- [21] Fang SJ, Zheng LY, Zhao ZW, et al. Effect of transcatheter arterial chemoembolization combined with thymosin alpha 1 on the autophagy of immune cells from advanced hepatocellular carcinoma[J]. *Zhonghua Yi Xue Za Zhi*, 2017, 97(25): 1942-1946
- [22] Liu A, Xu W, Xu H, et al. Therapeutic effect of transcatheter arterial chemoembolization combined with ultrasound-guided microwave ablation for treatment of liver cancer in special sites [J]. *Zhonghua Gan Zang Bing Za Zhi*, 2017, 25(12): 914-919
- [23] Chen ZY, Li XY, Zhao D, et al. Clinical analysis on hysteroscopic surgery for the treatment of type II cesarean scar pregnancy in the first trimester [J]. *Zhonghua Fu Chan Ke Za Zhi*, 2017, 52(10): 669-674
- [24] Wei XY, Yu XL. Comparison of the safety of two treatment methods of cesarean scar pregnancy of type II and III in menopause within 7 weeks[J]. *Zhonghua Fu Chan Ke Za Zhi*, 2017, 52(7): 449-454
- [25] Czuczwar P, Stepniak A, Szkodziak P, et al. Amenorrhea after chemoembolization and suction curettage of caesarean scar pregnancy [J]. *Ginekol Pol*, 2017, 88(11): 637-638
- [26] Zhang W, Hou B, Xu H, et al. Efficacy of uterine artery chemoembolization in treatment of cesarean scar pregnancy[J]. *Chinese Journal of Interventional Imaging & Therapy*, 2017, 14(1): 13-17
- [27] Mosad A, Altraigey A. Scar pregnancy and spontaneous rupture uterus-a case report[J]. *Ginekologia Polska*, 2017, 88(12): 698-699
- [28] Glenn TL, Bembry J, Findley AD, et al. Cesarean Scar Ectopic Pregnancy: Current Management Strategies [J]. *Obstet Gynecol Surv*, 2018, 73(5): 293-302
- [29] 王彩荣. 瘢痕妊娠患者应用子宫动脉化疗栓塞与子宫动脉栓塞方案对预后的影响比较[J]. *包头医学*, 2019, 43(2): 24-26
- [30] Chang G, Xie LL, Li WY, et al. Application of oxaliplatin in combination with epirubicin in transcatheter arterial chemoembolization in the treatment of primary liver carcinoma [J]. *J Biol Regul Homeost Agents*, 2017, 31(2): 459-464
- [31] Peng SY, Huang CY, Wang XA. Clinical effect of terminal branches portal vein embolization combined with transcatheter arterial chemoembolization on liver neoplasms[J]. *Zhonghua Wai Ke Za Zhi*, 2017, 55(9): 655-660
- [32] 李奎, 颜国辉, 邹煜. 子宫动脉栓塞与甲氨蝶呤治疗不同 MRI 分型的剖宫产术后瘢痕妊娠的疗效评价[J]. *中华介入放射学电子杂志*, 2017, 5(3): 128-134