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超声引导下 Mammotome 微创旋切术治疗乳腺良性肿块 *

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摘要 目的：研究超声引导下 Mammotome 微创旋切术对乳腺良性肿块的治疗价值。**方法：**回顾性分析 2014 年 9 月至 2016 年 9 月在本院就诊的 BI-RADS 分级为 2～3 级的 387 例乳腺良性肿块患者，运用 Mammotome 对 729 处乳腺病灶行微创旋切术，分析术后病理、并发症、随访半年后的治疗结果。**结果：**387 例患者的 729 处乳腺病灶均获一次性成功切除。病理示均为良性病灶，其中 32 个合并不典型增生。术后出现局部血肿共 11 例(2.8 %)，皮下瘀斑共 16 例(4.1 %)，所有患者均未发生感染及气胸等严重并发症。术后 6 个月 18 个在病灶原部位发现肿块；手术无残留率为 97.5 %。**结论：**应用超声引导下 Mammotome 微创旋切术治疗乳腺良性肿块临床可行。

关键词：超声引导；Mammotome 旋切术；微创；乳腺良性肿块

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Application of Ultrasound Guided Mammotome Minimally Spiral Resection in Treatment of Benign Breast Lesion*

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ABSTRACT Objective: To explore the application value of ultrasound guided Mammotome minimally spiral resection in treatment of benign breast lesion. **Methods:** A retrospective analysis of 387 patients with benign breast lesion (BI-RADS grade 2 and 3) received in our hospital between September 2014 and September 2016 was performed. 729 breast lesions of these 387 patients were resected by ultrasound guided Mammotome minimally spiral resection. Postoperative pathological examination was made and follow-up was conducted for 6 months to observe the therapeutic effect and complications. **Results:** All lesions were successfully resected in one time. The pathological results showed that there were 697 benign breast lesions and 32 benign lesions combined with atypical hyperplasia. Local hematoma occurred in 11 cases (2.8%) and ecchymosis in 16 cases (4.1%). In 6 months after operation, residual lesions were found at the original site in 18 lesions. The no residual rate was 97.5%. **Conclusion:** Ultrasound guided Mammotome minimally spiral resection is a safe and effective treatment.

Key words: Ultrasound guidance; Mammotome spiral resection; Minimally invasive; Benign breast lesion

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前言

乳腺肿瘤是女性肿瘤中发病率最高的，且近年来其发病有年轻化的趋势，严重威胁女性的健康。乳腺肿瘤患者最常发生的症状为乳腺肿块，临床上所发现的乳腺肿块大多数都是良性病变[1,2]。乳腺良性肿块不但能影响患者的生活质量，还有恶变的可能，因此需要及时地诊断与治疗。目前临床上针对乳腺肿块的诊治方法主要有穿刺活检和开放性手术，但是穿刺活检存在取材少和假阴性高等缺点，而开放性手术也有创伤较大及术后疤痕影响美观等不足[3,4]。Mammotome 微创旋切技术是一项较新的技术，近年来逐渐被应用于乳腺良性肿块的诊治，它主要是通过 3～5 mm 的切口对乳房的可疑病灶进行切除，既可以获得较为充足的组织标本，为病理诊断提供良好的条件，又可以作为治疗手段，切除微小病灶。该技术以其微创优势在乳腺肿块的诊断和治疗中得到越来越多的应用[5,6]。本院自 2014 年起在乳腺肿块的治疗中应用超声引导下 Mammotome 微创旋切术。报道如下。

1 资料和方法

1.1 一般资料

选择 2014 年 9 月～2016 年 9 月在解放军第 180 医院行 Mammotome 微创旋切术的 387 例乳腺肿块患者，患者术前均经彩超诊断为乳腺肿块且 BI-RADS 分级为 2～3 级，年龄为 26～69 岁，平均为(36.7± 2.8)岁；肿块单发者 133 例，多发者

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254 例,共 729 个肿块,其中 586 个可触及,143 个不可触及。所有患者均知情同意并签署手术知情同意书。

1.2 病例纳入与剔除标准

纳入标准[7]:① 彩超检查发现乳腺肿块且根据 BI-RADS 分级为 2～3 级;② 患者要求微创治疗;③ 肿瘤最大长径不大于 3 cm;④ 凝血功能正常;⑤ 无其他手术禁忌证。

剔除标准:① 临床高度怀疑恶性肿瘤,BI-RADS 分级大于 3 级;② 凝血功能有明显异常;③ 哺乳期妇女及孕妇;④ 伴有心、脑、肺及肾脏等系统疾病无法耐受手术者。

1.3 仪器与设备

超声检查使用 Siemens Acuson Antares 彩色多普勒超声系统,探头频率为 5～13 MHz。手术操作(微创旋切)使用美国强生公司生产的 Mammotome 系统。

1.4 手术方法

患者取仰卧位,上臂外展,充分暴露乳房。术前先行乳腺超声以确定病灶的部位、大小、形态、边界、内部回声、钙化灶及周围血流分布情况等信息。用十字交叉定位法定位之后,用黑色标记笔标记穿刺点。病灶分级采用 BI-RADS(美国放射学会)分级标准[3]。将 BI-RADS 分级为 2～3 级的患者初步诊断为良性并纳入研究。常规消毒,局部浸润麻醉(利多卡因),以标记的穿刺点为中心,切开 3～5 mm,在超声引导下经切口将旋切刀插入,调整方向,把旋切刀慢慢放入病灶基底部下方,然后打开旋切窗,将切割槽的中心对准病灶,打开旋切按钮,利用真空抽吸系统切除病灶。术中要根据超声图像,随时调整旋切刀槽,反复调整进行切割,直到乳腺病灶被完全切除干净。如果肿块有多处,还应再次在超声引导下进行定位并旋切。切割完毕后,抽吸局部积血并退出旋切刀,局部止血,加压包扎,确定无出血、气胸等并发症后,将病人送回病房。

1.5 观察指标与统计分析

记录所有患者的病灶大小、手术时间、术中出血量、创口直径、创口闭合时间及住院时间。所有病理标本均由两位经验丰富的病理科医师分别双盲阅片。记录并比较病灶最大径(彩超测得)与旋切次数的关系。术后观察患者并发症发生情况,并随访 6 个月,彩超监测手术部位肿块发生情况,计算无残留率。无残留率 = (手术病灶数 - 肿块残留数)/ 手术病灶数 [19]。用 SPSS22.0 统计软件对数据进行分析,计量资料以 $\bar{x}\pm s$ 表示,采用 t 检验进行比较,计数资料以%表示。

2 结果

387 例患者经超声诊断共 729 个病灶, 手术均获成功,全部一次性切除, 病灶区未见明显组织残留。病灶直径为 0.4～3.0 cm,平均(1.9± 0.3) cm;手术时间 19～53 min,平均(33.6± 2.8) min;术中出血量 8～26 mL,平均(11.3± 1.7) mL;创口直径 2.7～6.1 cm,平均(3.9± 0.8) cm;创口闭合时间 3～6 天,平均(4.1± 1.5)天;住院时间 3～7 天,平均(4.3± 1.4)天(见表 1)。

表 1 术中术后观察指标

Table 1 The indicators during Intraoperative and postoperative

	Range	$\bar{x}\pm s$
Lesion diameter(cm)	0.4～3.0	1.9± 0.3
Surgery time(minute)	19～53	33.6± 2.8
Intraoperative bleeding(mL)	8～26	11.3± 1.7
Wound diameter(cm)	2.7～6.1	3.9± 0.8
Wound closure time(days)	3～6	4.1± 1.5
Hospitalization time(days)	3～7	4.3± 1.4

术后病理显示:729 个病灶中,697 个为良性,32 个为良性合并不典型增生, 良性率为 95.6%。BI-RADS 2 级的病灶 586 个,其中 573 个为良性,良性率为 97.8%。BI-RADS 3 级的病灶 143 个,其中 124 个为良性,良性率为 86.7%(见表 2)。病灶最大径(D)与旋切次数的关系:① D＜1 cm 者共 379 个,平均旋切次数为(6.3± 1.4)次;② 1 cm≤ D＜2 cm 者共 285 个,平均旋切次数为(13.8± 2.6)次;③ 2 cm≤ D＜3 cm 者共 18 个,平均旋切次数为(30.1± 5.4)次;④ D≥ 3 cm 者共 47 个,平均旋切次数为(58.8± 3.9)次(见表 3)。

表 2 术后病理结果

Table 2 The pathological results after surgery

Lesions grade	No.	Benign	Benign atypical hyperplasia
BI-RADS 2	586	573(97.8%)	13(2.2%)
BI-RADS 3	143	124(86.7%)	19(13.3%)
Total	729	697(95.6%)	32(4.4%)

表 3 病灶最大径与旋切次数分析

Table 3 Analysis of the maximum diameter of lesions and the number of peeling

Maximum diameter(cm)	No.	Peeling cut(times)
D＜1	379	6.3± 1.4
1≤ D＜2	285	13.8± 2.6
2≤ D＜3	18	30.1± 5.4
D≥ 3	47	58.8± 3.9

术后 6 个月复查彩超,729 个病灶中有 18 个在病灶原部位发现肿块,说明超声引导下 Mammotome 微创旋切术的无残留率为 97.5%。并发症方面,387 例患者术后出现局部血肿 11 例(2.8%),皮下瘀斑 16 例(4.1%),6 个月后复查,全部吸收消失。所有患者术中及术后均未发生切口感染、气胸及其他严重并发症。

3 讨论

据文献报道,乳腺肿物中约有 80%为良性肿块[7,8]。目前乳腺良性肿块的治疗方法主要是早期行手术切除,但是传统的开放术式切口大,术后乳房留有明显的疤痕,对女性的生理和心理健康都是很大的创伤,因此很多女性都不愿选择手术治疗,并因此而延误了治疗的时机,导致了病情的进展[9]。此外,对于一些部位比较深的肿块,传统的开放手术往往难以准确定位,寻找困难,造成手术时间延长,手术创伤增大,增加了手术的并发症。随着微创手术技术的发展和女性对于美容手术要求的提高,乳腺微创手术越来越多地被应用于临床。

Mammotome 最早报道于 1994 年,在早期它的作用主要是用于乳腺病灶活检,随着技术的发展及器械的改良,逐渐将其应用于乳腺较小病灶的切除手术[5,10,11]。它的旋切功能主要通过旋切刀具与真空抽吸来实现,其旋切刀具和临床常用的粗活检针类似,主要由套管与针芯组成,每次切取的标本量比活检针大,既可以获得较为充足的组织标本,为病理诊断提供良好的条件,又可以用于切除病灶,达到手术治疗的目的[11,12]。同时其真空抽吸系统可以把切取的标本不接触周围组织而经过外套管取出体外,既不用重复多次切割,又能避免恶性传播的风险[9,13,14]。此外,真空抽吸系统还可以局部积血清除,防止术后血肿。由于 Mammotome 微创旋切与传统手术相比,具有创伤小、安全系数高、疤痕短及并发症发生率低等优势,已越来越多地被应用于临床[15,16]。Meloni 等在乳腺肿块的诊断中应用 Mammotome 系统,发现其准确率高达 97.3%,且特异性为 100%,远远高于目前常用的细针穿刺活检[17]。Salem 等比较两种乳房肿块切除技术,发现 Mammotome 微创旋切术的手术疤痕小,符合现代女性对美容手术的要求,且术后恢复时间短,平均只需 2～3 天就可以正常生活与工作[18]。Plantade 等在 382 例乳腺良性肿块患者的治疗中应用 Mammotome 术,发现该手术安全性好,创伤较小,并发症少,术后半年随访发现无肿瘤残留的比例为 93.7%[19]。本研究对 387 例患者共 729 个病灶行 Mammotome 微创旋切术,手术均获成功,术后半年无残留率为 97.5%,且均未发生严重并发症。

我们在临床工作中也注意到,Mammotome 术虽然是微创手术,但是如果操作不当,可能会发生皮下血肿、感染及气胸等并发症。经过反复实践及总结,我们建议在手术过程中应注意:(1)该手术全程需要超声引导与监测,因此乳腺外科医生和超声科医生要紧密配合,在手术全程均应利用超声实时引导,尤其是在切割过程中,应随时观察超声影像,一旦超出范围应及时停止,以减少对周围组织的损伤;(2)一些分病灶周围血管较为丰富,在超声影像中,可以看到血管走形,应注意躲避。如果术中不小心损伤了血管,发现血液渗出,必须立即停止切割,并立即采取局部加压等方法止血,待出血停止后方能继续进行手术;(3)如果病灶贴近皮肤,不能盲目切割,应该采用一定的压力把适量生理盐水注入皮肤与肿块之间的空隙,形成一定的间隙,避免切割时刀槽将皮肤卷入,造成损伤;(4)对于形态不规则的病灶和一些没有包膜的病灶,超声无法准确显示其边界,因此在切除过程中需要有一个大于声像图显示病灶的安全界限,以免损伤周围组织,而且在操作过程中要随时调整探头角度,始终清楚地显示病灶与旋切刀的关系。

综上所述,应用超声引导下 Mammotome 微创旋切术治疗乳腺良性肿块临床可行,具有一定的推广价值。

参 考 文 献(References)

[1] Pan S, Liu W, Jin K, et al. Ultrasound-guided vacuum-assisted breast biopsy using Mammotome biopsy system for detection of breast cancer: results from two high volume hospitals [J]. Int J Clin Exp Med, 2014, 7(1): 239-246

[2] Velazco CS, Wasif N, Pockaj BA, et al. Radioactive seed localization for breast conservation surgery: Low positive margin rate with no learning curve[J]. Am J Surg, 2017

[3] Ding B, Chen D, Li X, et al. Meta analysis of efficacy and safety between Mammotome vacuum-assisted breast biopsy and open excision for benign breast tumor[J]. Gland Surg, 2013, 2(2): 69-79

[4] Chatterjee A, Dayicioglu D, Khakpour N, et al. Oncoplastic Surgery: Keeping It Simple With 5 Essential Volume Displacement Techniques for Breast Conservation in a Patient With Moderateto Large-Sized Breasts[J]. Cancer Control, 2017, 24(4): 1073274817729043

[5] Yamaguchi R, Tanaka M, Tse GM, et al. Management of breast papillary lesions diagnosed in ultrasound-guided vacuum-assisted and core needle biopsies[J]. Histopathology, 2015, 66(4): 565-576

[6] Rajan S, Wason AM, Carder PJ. Conservative management of screen-detected radial scars: role of mammotome excision [J]. J Clin Pathol, 2011, 64(1): 65-68

[7] Wang K, Ye Y, Sun G, et al. The Mammotome biopsy system is an effective treatment strategy for breast abscess[J]. Am J Surg, 2013, 205 (1): 35-38

[8] Arko D, Cas Sikosek N, Kozar N, et al. The value of ultrasound-guided surgery for breast cancer[J]. Eur J Obstet Gynecol Reprod Biol, 2017, 216: 198-203

[9] Xu Y, Ming J, Zhou Y, et al. Mammotome-assisted endoscopic breast-conserving surgery: a novel technique for early-stage breast cancer[J]. World J Surg Oncol, 2014, 12: 99

[10] Debi U, Thulkar S, Sharma S, et al. Role of directional vacuum assisted breast biopsy in previously equivocal biopsies for breast masses suspicious for malignancy[J]. Malays J Pathol, 2015, 37(1): 25-33

[11] Mariscotti G, Durando M, Robella M, et al. Mammotome ((R)) and EnCor ((R)): comparison of two systems for stereotactic vacuum-assisted core biopsy in the characterisation of suspicious mammographic microcalcifications alone[J]. Radiol Med, 2015, 120(4): 369-376

[12] Ohsumi S, Taira N, Takabatake D, et al. Breast biopsy for mammographically detected nonpalpable lesions using a vacuum-assisted biopsy device (Mammotome) and upright-type stereotactic mammography unit without a digital imaging system: experience of 500 biopsies[J]. Breast Cancer, 2014, 21(2): 123-127

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geneic blood transfusion after total knee replacement[J]. Acta Orthop Belg, 2015, 81(4): 698-707

[17] Nichols CI, Vose JG. Comparative Risk of Transfusion and Incremental Total Hospitalization Cost for Primary Unilateral, Bilateral, and Revision Total Knee Arthroplasty Procedures [J]. J Arthroplasty, 2016, 31(3): 583-589.e1

[18] Kim TK, Chang CB, Koh IJ. Practical issues for the use of tranexamic acid in total knee arthroplasty: a systematic review [J]. Knee Surg Sports Traumatol Arthrosc, 2014, 22(8): 1849-1858

[19] Pagnotta G, Rich E, Eckardt P, et al. The Effect of a Rapid Rehabilitation Program on Patients Undergoing Unilateral Total Knee Arthroplasty[J]. Orthop Nurs, 2017, 36(2): 112-121

[20] Schaal T, Schoenfelder T, Klewer J, et al. Effects of perceptions of care, medical advice, and hospital quality on patient satisfaction after primary total knee replacement: A cross-sectional study [J]. PLoS One, 2017, 12(6): e0178591

[21] Churchill JL, Toney VA, Truchan S, et al. Using Aminocaproic Acid to Reduce Blood Loss After Primary Unilateral Total Knee Arthroplasty[J]. Am J Orthop (Belle Mead NJ), 2016, 45(5): E245-E248

[22] Maempel JF, Wickramasinghe NR, Clement ND, et al. The pre-operative levels of haemoglobin in the blood can be used to predict the risk of allogenicblood transfusion after total knee arthroplasty [J]. Bone Joint J, 2016, 98-B(4): 490-497

[23] Pannucci CJ, Cuker A. Commentary on: Rivaroxaban for Ve nous Thromboembolism Prophylaxis in Abdominoplasty: AMulticenter Experience[J]. Aesthet Surg J, 2016, 36(1): 67-70

[24] Pertlíček J, Stehlík J, Sadovský P, et al. The Effect of Tranexamic Acid on Blood Loss after Primary Unilateral Total Knee Arthroplasty. Prospective Single-Centre Study [J]. Acta Chir Orthop Traumatol Cech, 2015, 82(6): 418-423

[25] Mao Z, Yue B, Wang Y, et al. A comparative,retrospective study of peri-articular and intra-articular injection of tranexamic acidfor the management of postoperative blood loss after total knee arthroplasty [J]. BMC Musculoskelet Disord, 2016, 17(1): 438

[26] Guzel Y, Gurcan OT, Golge UH, et al. Topical tranexamic acid versus autotransfusion after total knee arthroplasty [J]. J Orthop Surg (Hong Kong), 2016, 24(2): 179-182

[27] Uğurlu M, Aksekili MA, Çağlar C,et al.Effect of Topical and Intravenously Applied Tranexamic Acid Compared to Control Group on Bleeding in Primary Unilateral Total Knee Arthroplasty [J]. J Knee Surg, 2017, 30(2): 152-157

[28] Kim DH, Lee GC, Lee SH, et al. Comparison of Blood Loss between Neutral Drainage with Tranexamic Acid and Negative Pressure Drainage without Tranexamic Acid Following Primary Total Knee Arthroplasty[J]. Knee Surg Relat Res, 2016, 28(3): 194-200

[29] Zou Y, Tian S, Wang Y, et al. Administering aspirin, rivaroxaban and low-molecular-weight heparin to prevent deep venous thrombosis after total knee arthroplasty[J]. Blood Coagul Fibrinolysis, 2014, 25(7): 660-664

[30] Wang JW, Chen B, Lin PC, et al. The Efficacy of Combined Use of Rivaroxaban and Tranexamic Acid on Blood Conservation in Minimally Invasive Total Knee Arthroplasty a Double-Blind Randomized, Controlled Trial[J]. J Arthroplasty, 2017, 32(3): 801-806

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[13] Kibil W, Hodorowicz-Zaniewska D, Popiela TJ, et al. Mammotome biopsy in diagnosing and treatment of intraductal papilloma of the breast[J]. Pol Przegl Chir, 2013, 85(4): 210-215

[14] Order BM, Schaefer PJ, Peters G, et al. Evaluation of two different vacuum-assisted breast biopsy systems: Mammotome (R) system 11G/8G vs. ATEC (R) system 12G/9G [J]. Acta Radiol, 2013, 54(2): 137-143

[15] Kawasaki T, Mochizuki K, Yamauchi H, et al. High prevalence of neuroendocrine carcinoma in breast lesions detected by the clinical symptom of bloody nipple discharge[J]. Breast, 2012, 21(5): 652-656

[16] Wang ZL, Liu G, Huang Y, et al. Percutaneous excisional biopsy of clinically benign breast lesions with vacuum-assisted system: comparison of three devices[J]. Eur J Radiol, 2012, 81(4): 725-730

[17] Meloni GB, Dessole S, Becchere MP, et al. Ultrasound-guided mammotome vacuum biopsy for the diagnosis of impalpable breast lesions [J]. Ultrasound Obstet Gynecol, 2001, 18(5): 520-524

[18] Salem C, Sakr R, Chopier J, et al. Pain and complications of directional vacuum-assisted stereotactic biopsy: comparison of the Mammotome and Vacora techniques [J]. Eur J Radiol, 2009, 72 (2): 295-299

[19] Plantade R, Hammou JC, Gerard F, et al. Ultrasound-guided vacuum-assisted biopsy: review of 382 cases [J]. J Radiol, 2005, 86 (9 Pt 1): 1003-1015