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小综述

植有脑深部电刺激器帕金森病人的麻醉

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帕金森病是一种中枢神经系统的退行性病，临床表现为静止性震颤，僵硬，行动迟缓和体态不稳。其病理学特征为黑质致密部多巴胺能神经元减少。药物治疗针对多巴胺能张力的减弱，用左旋多巴进行替代治疗。左旋多巴在体内可转化为多巴胺。治疗时伍用外周脱羧酶抑制剂（卡比多巴）和儿茶酚胺甲基转移酶（COMT）抑制剂（恩塔卡明）。其它治疗包括各种多巴胺受体激动剂，B 型单胺氧化酶（MAO）抑制剂，在难治性病例，则会用到脑深部电刺激器[1,2]。

围手术期基本原则

帕金森病人围手术期需要特别注意的事项很多，至少包括：气道管理困难，自主神经功能紊乱和药物相互作用等等。作为疾病特征之一的不自主运动也涉及到上呼吸道的肌群，由此导致病人对进入气道的分泌物和返流物移除困难。这些病人在麻醉诱导时和拔管时较容易发生

[1]**Trans Periop & Pain Med 2014 Volume 1 Issue 1 Page 17-18** 原著见：
http://itranspopmed.org/wp-content/uploads/2014/06/Anesthetic-considerations-Parkinson-Disease-with-DBS-KH.pdf

喉痉挛和误吸。由于病人的气道问题，通常会优先选择区域麻醉。但神经阻滞会加剧帕金森病人的自主神经功能紊乱，因此需要严密监测血压。左旋多巴的半衰期较短，只有 1-3 小时，而且只有口服制剂。手术时间长的病例可能需要在术中给药（经胃管给药）以预防苏醒后病人发生严重的帕金森症状[2]。如果术中无法给药，则术后必须尽早给[2,3]。帕金森病人禁止使用多巴胺能拮抗剂，包括吩噻嗪类（如丙氯拉嗪），氟哌利多，甲氧氯普胺，因为它们会使锥体外系副作用恶化。

植有脑深部电刺激器病人的特别注意点

脑深部电刺激器（Deep Brain Stimulator, DBS），也称脑起搏器，在精神和运动疾病中的应用日益增加。对药物治疗不敏感的帕金森病人安装后有时能改善一些症状。DBS 的电极需要精确地植入脑内（达到丘脑或基底节处），并与脉冲发生器连接。脉冲发生器一般安装在胸壁，位置选择与心脏起搏器差不多（位于一侧或双侧）[4,5]。图 1 所示为发生器装在左胸。探讨 DBS 植入术麻醉的文章已经发表了一些，但对于非神经外科手术中 DBS 管理的信息非常匮乏[5]。

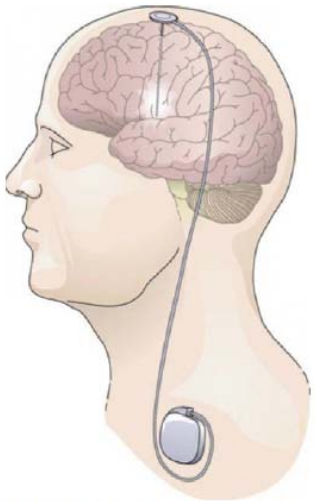

图1. 由电池供电的脑深部电刺激器通过导线与脑内电极连接
引用自：http://phys.org/news194718278.html#jCp

术前对 DBS 刺激器的评估包括查明当时植入的指证，已经植入多久，

以及刺激器对症状严重程度控制的效果。根据美敦力公司 DBS 销售部的建议，所有植入有美敦力 Ativa 平台产品的病人，都应该在手术当天把程序控制器（作用如同遥控器）带到医院。与心脏起搏器及植入式心脏复律除颤器（AICD）不同，DBS 并没有设计成可以对体外放置磁铁作出反应，因此必须使用程序控制器。但与心脏起搏器和 AICD 相同的是，理论上电凝器也会损坏 DBS 的电极或脉冲发生器，可以导致内部电路故障，程序破坏，电极损坏甚至造成永久性中枢神经损伤。慎重起见，应尽量使用双极电凝，使用单极电凝时回路电极板应尽可能放置在靠近手术的部位。另外，DBS 也可能干扰心电图而影响心电图判读[6,7]。

制造商建议术中关闭 DBS。但我们必须注意尽量缩短 DBS 关闭的时间，以减轻苏醒后病人帕金森症状的严重程度。根据美敦力 DBS 专家的建议（私人电子邮件咨询），如果病人是有症状的，最好在全麻诱导后才关闭 DBS。如果诱导前就关闭，病人会出现运动障碍，就会使插管、穿刺等操作变得更困难。安置病人体位时也需要格外小心，颈部牵拉可能会影响甚至损坏 DBS 电极。病人苏醒前就应该重新开启 DBS，这不仅有利于拔管，也减轻病人苏醒后因帕金森症状而承受的痛苦[6]。

（周大春 译）

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参考文献

1. Tinklepaugh MS. Chapter 29 Parkinson's disease. In Atchabahian A, Gupta R (2014) The Anesthesia Guide. 109-111.
2. Nicholson G, Pereira AC, Hall GM (2002) Parkinson's disease and anaesthesia. Br. J. Anaesth. 89: 904-916.
3. Gálvez-Jiménez N, Lang AE (2004). The perioperative management of Parkinson's revisited. Neurol Clin. 22: 367–377.
4. Deiner S, Hagen J (2009) Parkinson's disease and deep brain stimulator placement. Anesthesiology Clinics. 27: 391-415.
5. Venkatraghavan L, Luciano M, Mannien P (2010) Anesthetic management of patients undergoing deep brain stimulator insertion." Anesthesia Analgesia. 110: 1138-1145.
6. Garg, R, Borthakur B, and Pawar M (2011) Management of patient with deep brain stimulator for emergency laparotomy. J Neurosurg Anesthesiol 23:168

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Mini Review

Anesthetic Considerations in Patients with Parkinson Disease and Deep Brain Stimulators

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Parkinson's disease is a neurodegenerative disorder of the central nervous system (CNS) clinically manifested by resting tremor, rigidity, bradykinesia, and postural instability. The pathology is characterized by loss of dopaminergic neurons within the pars compacta of the substantia nigra. Pharmacologic treatment centers on replacing this lost dopaminergic tone with levodopa, converted to dopamine in vivo. This is administered in conjunction with peripheral decarboxylase inhibitors (carbidopa) or catechol-o-methyltransferase (COMT) inhibitors (entacapone). Other therapies include other dopamine receptor agonists, type B monoamine oxidase (MAO) inhibitors and, in refractory cases, deep brain stimulation.[1,2]

Common Perioperative Considerations

There are many perioperative considerations specific to patients with Parkinson's disease including, but not limited to, difficulties of airway management, autonomic dysregulation, and medication interactions. The muscles of the upper airway are also involved in the involuntary movement characteristic of the disease, which can subsequently cause poor handling of secretions and aspiration. These patients are predisposed to both laryngospasm and aspiration during induction of anesthesia and on extubation. Regional anesthesia is often preferred in this patient population given the airway challenges. The autonomic dysfunction seen in patients with Parkinson's disease, however, can be exacerbated by neuraxial anesthesia and close blood pressure monitoring is required. Levodopa has a short half life of 1-3 hours and is only available as an oral medication. In long cases it may be necessary to give this medication intraoperatively (via orogastric or nasogastric tube) to prevent onset of severe Parkinson symptoms after emergence.[2] If this is not feasible it is important to resume this medication as soon as possible post-operatively.[2,3] Patients with Parkinson's disease should not receive antidopaminergic medications such as phenothiazines (i.e. prochlorperazine), droperidol, or metoclopramide, as they may exacerbate extrapyramidal side effects.

Special considerations for Patients with Deep Brain Stimulators

Deep brain stimulators (DBSs) are increasingly being used to treat psychiatric and movement disorders. Patients with Parkinson's disease refractory to medical therapy can sometimes achieve some symptomatic benefit from these devices. DBS leads are carefully implanted in the brain (targeting the thalamus or basal ganglia) and connected to a pulse-generating device that is placed over the chest wall in a position similar to that used for cardiac pacemakers (on one side or both sides).[4,5] Figure 1 demonstrates a
stimulator on the left chest. There are several publications discussing the anesthetic management for DBS placement, however, there is a paucity of information on intraoperative DBS management for nonneurological procedures.[5]

A pre-operative assessment of a DBS device should include understanding the original indication for placement, how long it has been in place, and what effect the device has had on severity of symptoms. According to the Medtronic DBS Sales Department, it is recommended that all patients who have the Medtronic Ativa platform devices bring their patient programmers (resembles a remote) with them to the hospital on the day of the procedure, as these devices are unlike pacemakers and automated implantable cardioverter-defibrillators (AICDs) and not designed to respond to placement of an external magnet. Similar to AICDs and pacemakers, however, there is a theoretical risk that electrocautery could damage the DBS leads or pulse generating device. This could potentially result damage to the device's internal circuitry or programming, damage to the leads, or even permanent CNS injury. As a precaution, bipolar electrocautery should be used when possible and grounding pads should be placed close to the surgical site. The device may also interfere with ECG tracing and limit ECG interpretation.[6,7]

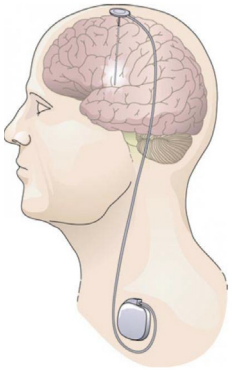

Fig.1 Battery powered deep brain stimulator is connected by extension wires to electrodes placed deep within the brain.
Source: http://phys.org/news194718278.html#jCp

The manufacturer's recommendation is that the DBS device be switched off during surgery. However, one must be cognizant of minimizing the length of time that the device is turned off so as to limit the severity of Parkinson symptoms after emergence.According to Medtronic DBS Consultant (personal email communication), if the patient has severe underlying symptoms it may be best to turn off the device after induction of general anesthesia. If turned off prior to induction the patient may develop dyskinesias, which may make interventions such as endotracheal intubation and vascular access more difficult. Careful attention should be paid to patient positioning, as neck manipulation can interfere with and possibly damage the DBS device leads. The device should be turned on again prior to emergence to not only facilitate a smooth extubation but also to minimize patient suffering of Parkinson symptoms after emergence.[6]

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References

1. Tinklepaugh MS. Chapter 29 Parkinson's disease. In Atchabahian A, Gupta R (2014) The Anesthesia Guide. 109-111.

2. Nicholson G, Pereira AC, Hall GM (2002) Parkinson's disease and anaesthesia. Br. J. Anaesth. 89: 904-916.

3. Gálvez-Jiménez N, Lang AE (2004). The perioperative management of Parkinson's revisited. Neurol Clin. 22: 367–377.

4. Deiner S, Hagen J (2009) Parkinson's disease and deep brain stimulator placement. Anesthesiology Clinics. 27: 391-415.

5. Venkatraghavan L, Luciano M, Mannien P (2010) Anesthetic management of patients undergoing deep brain stimulator insertion." Anesthesia Analgesia. 110: 1138-1145.

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