

0120. Doctors Complete First Successful Face and Whole-Eye Transplant 医生成功完成首例面部和全眼移植手术

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1. Doctors Complete First Successful Face and Whole-Eye Transplan 医生完成首例成功的面部和全眼移植手术



This week **doctors announced** they had completed the first successful transplant of a partial face and an entire eye.

本周，医生宣布他们已经成功完成了首例部分面部和整个眼睛的移植手术。

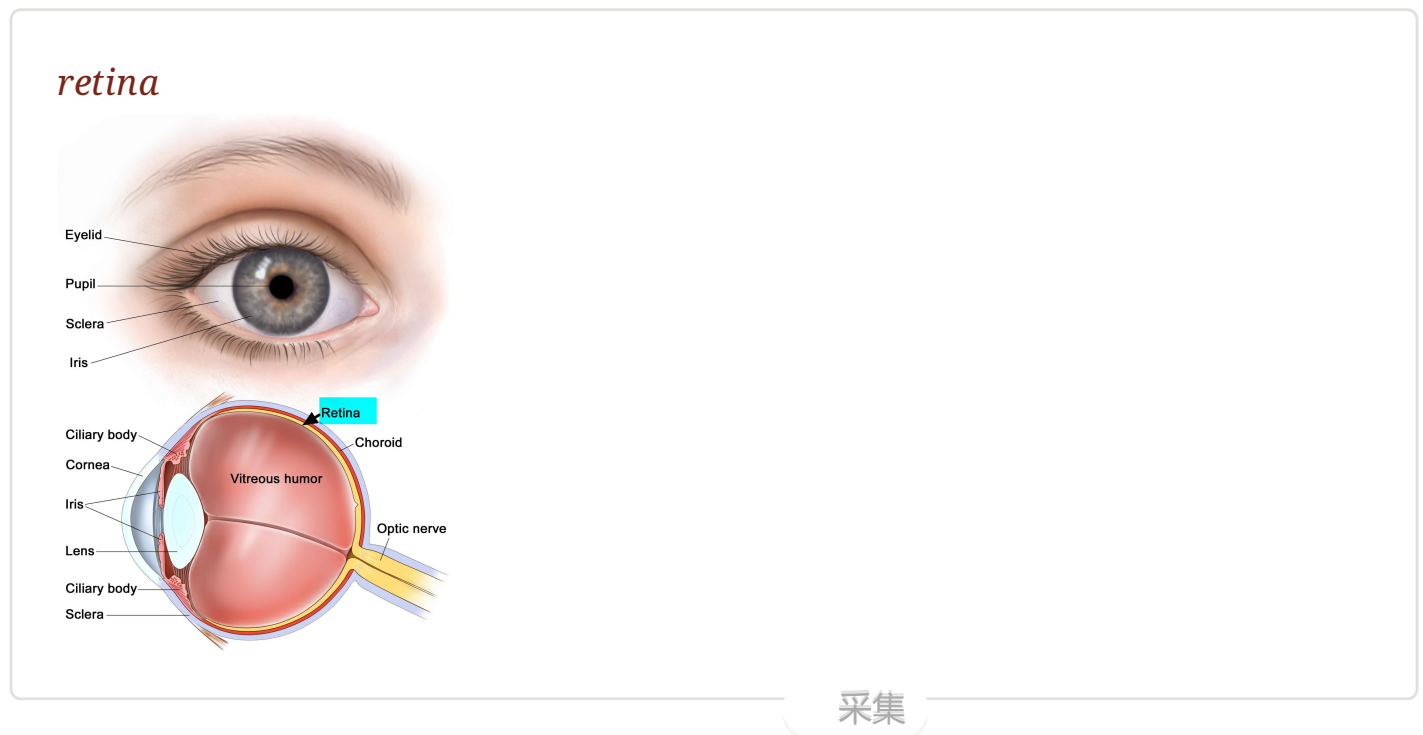
He 指病人 does not yet have vision in the transplanted eye and may never regain it there, but early evidence suggests the eye itself is healthy and may be capable of **transmitting** neurological 神经系统的; 神经 (病) 学的 signals to the brain.

他的移植眼睛还没有视力，而且可能永远无法恢复视力，但早期证据表明眼睛本身是健康的，并且可能能够将神经信号传输到大脑。

the main obstacle is achieving **regeneration 再生，重生；重建** of the **optic 眼的；视觉的 nerve**, which **carries** visual signals **from** the retina 视网膜 **to** the brain; this step **has not yet been successfully demonstrated** (v.)证明；证实；论证；说明 in humans.

主要障碍是实现视神经的再生，视神经将视觉信号从视网膜传送到大脑；这一步骤尚未在人类身上成功证实。

Example 1. 案例



Cutting-edge three-dimensional (3D) computer surgical 外科的；外科手术的 planning, **along with** patient-specific 特定的;特有的；独特的 3D cutting guides, enabled **precise alignment 排成直线，摆放恰当** of **bones** and **optimal 最佳的，最适的 placement** of implantable plates and screws.

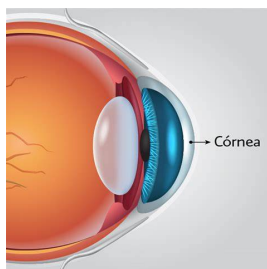
尖端的三维 (3D) 计算机手术规划, 以及针对患者的 3D 切割指南, 可实现骨骼的精确对准, 以及可植入板和螺钉的最佳放置。

Face and cornea 角膜 transplants have been performed before, yet to the NYU Langone team's knowledge, this is the first time a whole eye has been transplanted successfully (with or without a face).

此前曾进行过面部和角膜移植手术，但据纽约大学朗格尼团队所知，这是首次成功移植整只眼睛（无论是否有面部）。

Example 2. 案例

cornea



The decision was made **to transplant (v.) the donor's eye** as well, because **even if** James 病人 never regained sight, the organ would help restore (v.) his face's appearance.

(此次治疗,)还决定移植捐赠者的眼睛, 因为即使詹姆斯(病人)永远无法恢复视力, 该器官也将有助于恢复他的面部外观。

Like any transplant, **there was a chance** his immune system would reject the eye — but he would already **need to take immunosuppressant 免疫抑制剂 medication 药物** for the face transplant.

与任何移植一样, 他的免疫系统有可能会排斥眼睛, 但他已经需要为面部移植服用免疫抑制剂。

主 **The portions 部分 of the face** that were transplanted 谓 included the nose, left eyelids and eyebrow, lips, underlying skull, nasal 鼻的; 与鼻子相关的 and chin 颏; 下巴 bones, cheekbones 颧骨, and **all of the muscle and nerve tissue** under the right eye.

被移植的面部部分包括: 鼻子、左眼睑和眉毛、嘴唇、头骨下方、鼻骨和下巴骨、颧骨, 以及右眼下方的所有肌肉和神经组织。

The entire left eye and optic nerve 视神经 were transplanted, and 主 **stem cells** from the donor's **bone marrow 骨髓** 谓 were transplanted **along with them** in the hopes of **helping the optic nerve regenerate (v.)**.

整个左眼和视神经被移植, 来自捐赠者骨髓的干细胞也随之被移植, 希望能帮助视神经再生。

James has since made a good recovery.

詹姆斯此后恢复良好。

He is able to talk, and although **he does not have much ability** to move his lips and facial muscles yet, Rodriguez says **he will recover a lot of that ability** with time.

他能够说话，虽然他还没有太多移动嘴唇和面部肌肉的能力，但罗德里格斯说，随着时间的推移，他会恢复很多这种能力。

As of 从...开始，截至...,以...时点为分隔线 six months post-transplantation, James does not yet report (v.) any vision in the transplanted eye.
截至移植后六个月，詹姆斯尚未报告移植的眼睛有任何视力。

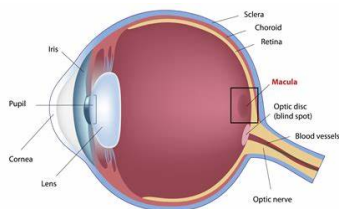
Cross-sectional 截面的，断面的，剖面的 **imaging** of the donated eye's macula (视网膜) 黄斑 (the central part of the retina 视网膜) showed **it was thinner** after the transplant — but **this had been expected** because the blood supply had been necessarily disrupted, and **a fair** (数量、大小) 相当大的 **number of** photoreceptors 视细胞；光感受器 — **light-sensitive cells** in the retina — were still present.

捐赠眼睛的黄斑（视网膜的中央部分）的横截面成像显示，移植后黄斑变薄，但这是预料之中的，因为血液供应必然受到破坏，并且有相当数量的感光细胞（光敏细胞），在视网膜中仍然存在。

Example 3. 案例

macula

N a small spot or area of distinct colour, esp the macula lutea 斑点或斑疹; 特指视网膜黄斑



The photoreceptors **appear to be** responsive (a.) 反应敏捷；反应积极 to light in **preliminary** 预备性的；初步的；开始的 tests.

在初步测试中，光感受器似乎对光有反应。

The medical team **plans to conduct (v.) more rigorous follow-up (n.)**后续行动；后续事物 **testing soon** to confirm this, however.

不过，医疗团队计划很快进行更严格的后续测试，以证实这一点。

Scientists have been **working toward** whole-eye transplantation for many years. 多年来，科学家们一直致力于全眼移植。

Although eye transplants **have been done** in rodents 啮齿动物 with some success, the animals' eyes **are much smaller** and less vascularized 血管化 than those of humans.

尽管啮齿类动物的眼睛移植取得了一些成功，但动物的眼睛比人类的眼睛小得多，血管化也少得多。

Goldberg and his team **have done some research** on pig eyes, which are more similar to humans', but **optic nerve** regeneration remains (v.) a challenge.

戈德堡和他的团队对猪的眼睛进行了一些研究，猪的眼睛与人类的眼睛更相似，但视神经再生仍然是一个挑战。

surgery **is only a small part of the issues** that need to be addressed (v.)设法解决；处理；对付 **in order to** restore (v.) eye function, however.

然而，手术只是恢复眼功能需要解决的问题的一小部分。

These include **making sure** the immune system doesn't reject the donor eye, which is a challenge with any type of transplant.

其中包括确保免疫系统不会排斥供体眼睛，这对任何类型的移植来说都是一个挑战。

Then **the corneal 角膜的 nerve** — which **carries** sensory 感觉的；感官的 signals **from** the transparent 透明的；清澈的 part of the eye — must be reconnected.

然后，角膜神经必须重新连接。角膜神经的作用，是传送来自眼睛透明部分的感觉信号。

Yet **the most complex part** is regenerating the optic nerve.

然而最复杂的部分，是视神经的再生。

In order to do so, surgeons have to **coax (v.)**哄劝；劝诱 **the nerve fibers** to grow to the right place, **which** Sahel says **could take months or even years**.

为了做到这一点，外科医生必须诱导神经纤维生长到正确的位置，萨赫勒说这可能需要数

月甚至数年的时间。

And complete (a.) optic nerve regeneration **has not yet been successfully achieved** in humans or other mammals.

而且在对人类或其他哺乳动物的实验中,都尚未成功实现"视神经"的完全再生。

Even if **the optic nerve** can regrow, **there is the question of** whether the brain will be able to **interpret (v.) the signals** from the transplanted eye.

即使视神经可以再生,也存在大脑是否能够解释来自移植眼睛的信号的问题。

The brain **has a lot of plasticity** 可塑性; 塑性, so **there is some reason** to hope it **may be able** to adapt (v.) to the new input.

大脑具有很大的可塑性, 因此有理由希望它能够适应新的输入。

Until **these questions are addressed**, **"I'm doubtful that** you will get a successful transplant **in terms of** restoring function 功能恢复."

在这些问题得到解决之前, "我怀疑您能否在功能恢复方面, 获得成功的移植。"

2. Doctors Complete First Successful Face and Whole-Eye Transplan

This week doctors announced they had completed the first successful transplant of a partial face and an entire eye.

He does not yet have vision in the transplanted eye and may never regain it there, but early evidence suggests the eye itself is healthy and may be capable of transmitting neurological signals to the brain.

the main obstacle is achieving regeneration of the optic nerve, which carries visual signals from the retina to the brain; this step has not yet been successfully demonstrated in humans.

Cutting-edge three-dimensional (3D) computer surgical planning, along with patient-specific 3D cutting guides, enabled precise alignment of bones and optimal placement of implantable plates and screws.

Face and cornea transplants have been performed before, yet to the NYU Langone team's knowledge, this is the first time a whole eye has been transplanted successfully (with or without a face). The first partial face transplant was performed in 2005 in France.

The decision was made to transplant the donor's eye as well, because even if James never regained sight, the organ would help restore his face's appearance. Like any transplant, there was a chance his immune system would reject the eye—but he would already need to take immunosuppressant medication for the face transplant.

The portions of the face that were transplanted included the nose, left eyelids and eyebrow, lips, underlying skull, nasal and chin bones, cheekbones, and all of the muscle and nerve tissue under the right eye. The entire left eye and optic nerve were transplanted, and stem cells from the donor's bone marrow were transplanted along with them in the hopes of helping the optic nerve regenerate.

James has since made a good recovery. He is able to talk, and although he does not have much ability to move his lips and facial muscles yet, Rodriguez says he will recover a lot of that ability with time.

As of six months post-transplantation, James does not yet report any vision in the transplanted eye.

Cross-sectional imaging of the donated eye's macula (the central part of the retina) showed it was thinner after the transplant—but this had been expected because the blood supply had been necessarily disrupted, and a fair number of photoreceptors—light-sensitive cells in the retina—were still present, Dedania says. The photoreceptors appear to be responsive to light in preliminary tests. The medical team plans to conduct more rigorous follow-up testing soon to confirm this, however.

Scientists have been working toward whole-eye transplantation for many years.

Although eye transplants have been done in rodents with some success, the animals' eyes are much smaller and less vascularized than those of humans. Goldberg and his team have done some research on pig eyes, which are more similar to humans', but optic nerve regeneration remains a challenge.

surgery is only a small part of the issues that need to be addressed in order to restore eye function, however. These include making sure the immune system doesn't reject the donor eye, which is a challenge with any type of transplant. Then the corneal nerve—which carries sensory signals from the transparent part of the eye—must be reconnected. Yet the most complex part is regenerating the optic nerve. In order to do so, surgeons have to coax the nerve fibers to grow to the right place, which Sahel says could take months or even years. And complete optic nerve regeneration has not yet been successfully achieved in humans or other mammals.

Even if the optic nerve can regrow, there is the question of whether the brain will be able to interpret the signals from the transplanted eye. The brain has a lot of plasticity, so there is some reason to hope it may be able to adapt to the new input. Until these questions are addressed, "I'm doubtful that you will get a successful transplant in terms of restoring function."
