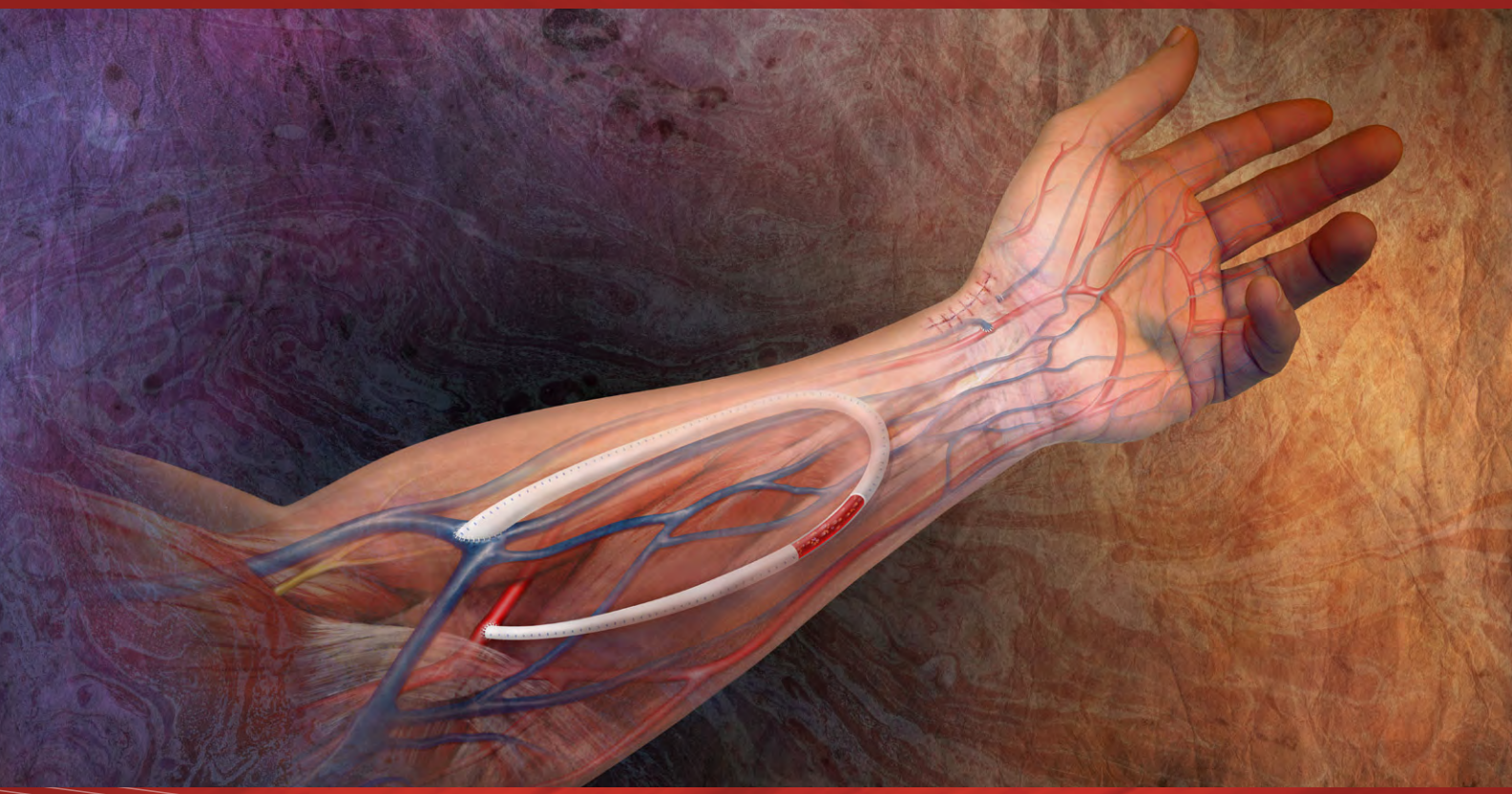
# 血液透析人工血管动静脉瘘护理及穿刺技术



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# 戈尔（GORE）血液透析人工血管：护理及穿刺技术

血液透析患者的长期支持治疗需要安全有效的穿刺动静脉瘘，这对于以戈尔（GORE）人工血管动静脉瘘作为透析通路的患者也十分重要。透析护士在相当大的程度上担负着确保充分透析的责任。尽管患者个人情况和透析中心设备都各不相同，但是从各主要透析中心多年所积累的经验中，已经证实了一些有益的人工血管穿刺技术。坚持使用这些技术有助于提高人工血管动静脉瘘的使用寿命并改善患者的生活质量。此外，穿刺进度也会更快、问题更少，从而提高透析室的整体效率。

# 人工血管

在30多年的应用中，戈尔（Gore）人工血管始终能战胜最苛刻的血管手术难题的挑战。凭借公认的优异性能和质量，赢得了全球知名外科医生的青睐。这些人工血管无需预凝处理、抗膨胀并能够防止感染扩散，并最大程度保障血栓切除术的安全。 Gore人工血管具有多种规格型号，包括延展性及非延展性，直型、锥型及分叉型等构型，以及由外环支撑或一体式内环径向支撑的结构。

## GORE人工血管的穿刺

在手术植入Gore 人工血管后，医生通常要求等待几周 后才能进行穿刺。 患者愈合情况各有不同，但在这段时间内，组织充分生长进入人工血管外壁 ，使人工血管得以固定。 这对于预防感染和血肿至关重要。

在某些情况下，医生可能会建议患者在没有完全愈合之前接受血液透析。 在此，对于这些患者的护理工作必须极为小心，[参见*早期穿刺特别注意事项*部分]。 **只有在别无他选的情况下，才能考虑进行立即或提早人工血管穿刺。**

# 人工血管动静脉瘘评估

## 人工血管穿刺前的愈合期

患者的人工血管良好愈合后，穿刺部位的检查即成为每次透析时的常规步骤。感染、血肿和假性动脉瘤会引发诸多问题，使穿刺变得十分困难，甚至十分危险。早期发现这些问题并及时告知医生可以保护人工血管甚至拯救患者的生命。最严重的并发症包括：

- **感染**
- **假性动脉瘤**
- **血肿**

### 感染

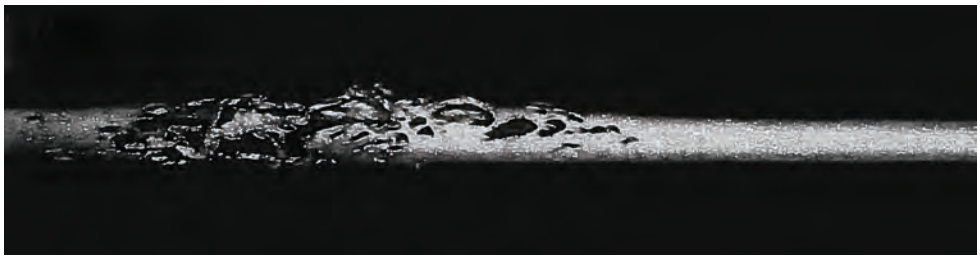
穿刺部位出现感染的表现有局部肿胀、发红、疼痛和流脓。 如果出现这些或其他可疑症状，应立即通知医生。 **切勿在感染区域入针。**因为这样，会直接将细菌引入到血液中。 严格遵守无菌技术可显著减少感染的几率[参见*无菌操作部分*]。

### 假性动脉瘤

假性动脉瘤，是指血液漏出人工血管并被周围组织包裹 而形成的血肿。 这种血液渗漏主要由两个因素造成。 在同一部位反复穿刺破坏了人工血管的完整性，以及静脉吻合口或流出道狭窄导致人工血管内的压力升高。[1] 这种压力可能会迫使血流通过人工血管上的穿刺针孔流入血管周边组织，从而导致假性动脉瘤。 为了阻止假性动脉瘤增大，必须对所有静脉流出道的显著狭窄部位实施经皮腔内血管成形术（PTA）。 对病变部分成功实施PTA可以减少人工血管内压力，减少进入假性动脉瘤的血流量。

假性动脉瘤的进行性增大可能会导致穿刺困难并且在拔针时难以止血。 假性动脉瘤增大的其他并发症包括被覆皮肤破裂、自发性出血和急性假性动脉瘤囊破裂。 人工血管感染的几率也会增大。[2]

在同一部位反复穿刺（“一处多穿”）或“穿刺处撕裂（病变）”，都会导致假性动脉瘤。沿着整个人工血管的长度进行 轮换穿刺是至关重要的，可谓重中之重。



*人工血管 “一处多穿”部位。*

## 血肿

血肿是人工血管穿刺部位出血未得到控制的结果。血液在组织和人工血管壁之间扩散开来，导致肿胀和变色。 请勿通过血肿部位穿刺。 因为 穿刺针通常会凝血，从而需要在一个新部位穿刺人工血管。 而且，在穿刺失败的位置必须施以压力以防止血肿扩大，因而使穿刺难度增大。同时也会使得可穿刺位置减少。

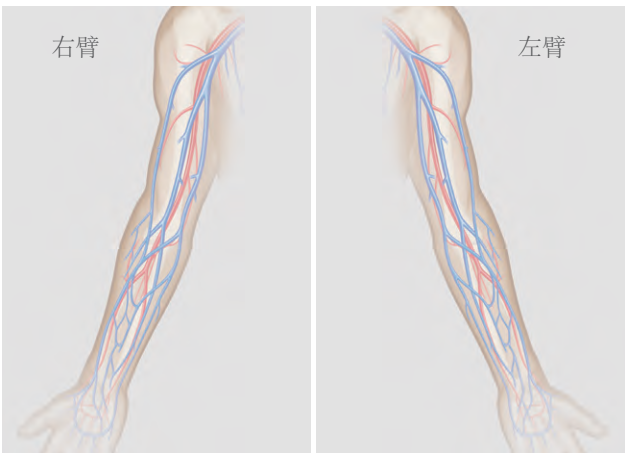
根据血肿的严重性，请及时咨询医生，清除血肿并纠正血肿出现的原因。 穿刺期间和之后，谨慎的操作将大大降低血肿的发生率[参见*穿刺技术部分*]。

## 检查人工血管的血流量

在任何时间，如果人工血管的血流量降低，不仅会加大血液导入透析机的难度，还可能造成人工血管闭塞的情况。 要检查管腔内是否有足够的血流，可以触诊整个人工血管是否有强烈“震颤”。 震颤的手感是皮下的持续振动，而不是脉搏跳动的感觉。 有跳动感的搏动表明在血液通路中存在着狭窄处。 血管震颤则表明血流量充足。

如果不能触摸到震颤，可以用听诊器听辨血液快速流过人工血管时的声音，或“杂音”。 这两者在强度和性质上的变化都应该记录在患者病历表上。 如果没有震颤或者杂音，请勿进行穿刺。

了解透析人工血管内的血流方向也十分重要。 静脉针应与血流方向相同。 这样可以防止出现再循环，并有助于静脉回流处于正常状态。 在理想情况保持下，外科医生应提供一张示意图用以说明人工血管的位置和血液流动的方向。 如果没有示意图，您可以 使用下面这个简单方法来判断血流方向。



*透析穿刺计划表*

用手指对人工血管中部施加短暂的压力，并触诊人工血管的震颤。脉动最强的一边就是血液进入人工血管的方向，即动脉侧。

## 针具选择

应使用能够达到透析机所需流量的最小尺寸的针具。 因此，超薄壁带背孔针是很好的选择。 针的长度则因人工血管在组织中的深度不同而异。 在大多数情况下，一英寸长的针是适宜的，有助于减少损坏人工血管后壁的几率。 一般来讲，总是选择适合患者的最小最短的针具。

## 评估人工血管动静脉瘘

使用透析穿刺计划图表来标出穿刺位置和日期有助于纪录已用的穿刺部位并且避免“一处多穿”。 穿刺位置应该在人工血管的直行部分，并且应远离人工血管与动脉或静脉缝合处至少三厘米。穿刺点之间应保持一厘米左右的间距。两到三周之后才能从原来穿刺点一厘米以内进行穿刺。

U形人工血管的弧形转弯部分不宜穿刺，因为很难正确定位穿刺针。 尤其是如果使用的是有外环的人工血管，这些防止人工血管扭结的外环正处于这个区域，它们的存在可能对穿刺造成额外困难。

# 无菌准备

必须彻底消毒皮肤以减少人工血管感染的几率。 实施穿刺应被视为具有污染和感染风险的外科手术。 根据各血液透析中心的章程，透析工作人员可自由选择配戴无菌手套。 但是，应避免徒手、用非无菌手套或器械或者透析设备接触消毒好的针头穿刺部位。 要确保合理使用手术口罩。 血液透析患者中，有很高比例（32-81%）在鼻腔中携带有高于正常水平的金黄色葡萄球菌。[3]

患者在进入透析室时应使用抗菌肥皂和水清洗他们的穿刺部位。 在使用抗菌剂前先给予 异丙醇有助于清除皮肤上的污垢和油脂。 在检查选定的穿刺部位后，用2%的葡萄糖酸氯己定/70%的异丙醇或70%的酒精和/或10%的聚维酮碘清洗选定的部位。[4]

2%葡萄糖酸氯己定/ 70%异丙醇抗菌剂对皮肤具有快速（30秒）和持久（长达48小时）的抗菌作用。 应用该溶液时来回涂擦30秒。 等该部位变干。 不要擦掉溶液。[4]

酒精能够起到短暂的抑菌作用，应该在进针前揉擦一分钟。[4]

聚维酮碘需要2-3分钟才能充分发挥抑菌作用，必须在其变干后进行穿刺。[4]

# 穿刺技术

使用两个透析针进行血透时，动脉穿刺针可以顺着血流方向也可逆着血流方向进针。当动脉穿刺针的方向为顺血流方向时，引起的血流湍流比较小。静脉穿刺针（回流）则必须始终顺血流方向进针。如果使用单个透析针进行透析，穿刺针必须始终顺血流方向进针。

沿进针方向相反的方向，绷紧进针处的皮肤。压力不可过大，否则会使得人工血管变平而不易穿刺。[图1]

*图1*

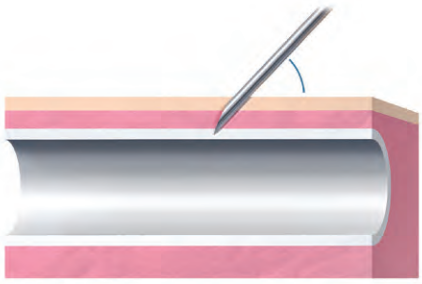


*图2*

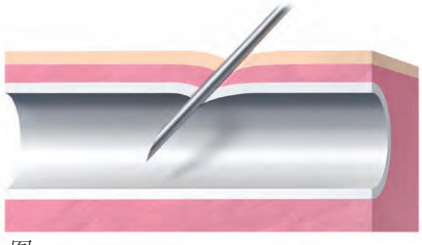


*图3*

通常，穿刺时针头斜面朝上并按照一定角度刺入皮肤。进针的角度则取决于人工血管的形状，位置和深度 [图2]。

保持理想进针角度，轻轻的将针刺入人工血管壁。 [图3]

固定住人工血管的位置，有利于加强穿刺的准确性。注意观察回血的情况，如果没有回血或者回血缓慢，需确认针尖的位置，可以尝试用注射器灌洗针头及导管。没有回血或者回血缓慢的潜在原因包括：

- 穿刺针斜面抵触人工血管壁
- 针头未完全刺入人工血管
- 针头已穿透人工血管前、后壁
- 患者血压偏低
- 由于 血液透析通路堵塞，人工血管内血流欠佳

确认回血良好后，继续向前推针少许，深度不超过八分之一英寸（约3.2毫米），以确保针尖位于管腔内。

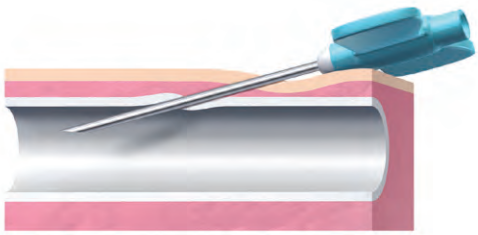


*图4*

*图5*

继续进针，直到针座[图4]。此推入过程中，保持穿刺针贴近皮下或者近乎平行于皮肤，有利于避免穿透人工血管后壁。

以约45°的角度进针，会在人工血管壁的穿刺部位形成一个活瓣。这个活瓣在拔针时，发挥类似“阀门”的功能以减少穿刺点出血 [图 5 ]。

如果平行进针，则有可能损伤人工血管。

随着经验的积累，透析护士/技术人员对于人工血管穿刺将会有获得准确的手感。

在整个穿刺过程中，切勿污染消毒过的穿刺部位。注意观察反常的阻力或者疼痛。一旦穿刺针完全推入并且固定针翼后，患者应该不会感到不适。持续的疼痛有可能表明针头刺入了人工血管后壁，这种情况下，回抽血流往往是缓慢或者不规则的。这些问题必须在继续进行透析之前解决。

# 透析完成后

透析完成后，应小心拔针，并以指端轻压止血。轻轻按压穿刺针刺入人工血管处比按压刺入皮肤处的止血效果要好。用棉球或者纱布敷在针刺入人工血管的位置并保持适度的压力[图 6]，直到出血停止。通常需要按压10-15分钟以达到止血效果。

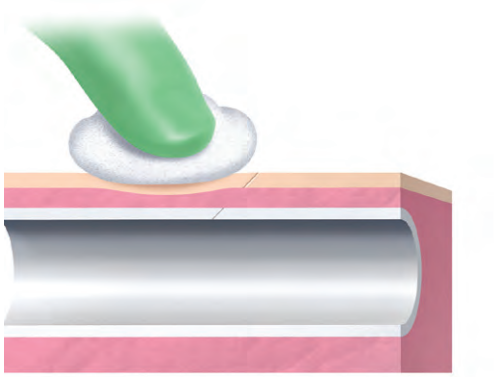


*图6*

检查穿刺点是否有异常出血的征兆。

在止血时，需要把握压迫的力道。一方面，要施以足够的压力以避免穿刺点出血，另一方面，又要防止压力过大而导致人工血管血栓形成。有时候，根据患者的实际情况，也可用手臂止血夹加压止血。

最后，请 在病历上记录穿刺位置和穿刺日期。

# 早期穿刺的特别注意事项

在特定情况下，医生可能会决定，患者在植入人工血管不久之后就必须接受血液透析治疗。对待这类患者必须格外谨慎，因为出现静脉流出道损伤、血肿和感染的危险很大。

由于术后肿胀，定位人工血管和置入穿刺针会比较困难。穿刺针错位可能会损坏人工血管或穿透人工血管后壁。可用手指轻轻按压来暂时推开肿胀的组织。这样就可以通过触诊或者使用听诊器听辨杂音来确定人工血管的位置。在这些情况下，外科医生所供的示意图就会非常有用。

严格遵守无菌技术是早期穿刺的关键。由于手术切口没有足够的时间充分愈合，建议配戴无菌手套和口罩。

透析完成后，要按压人工血管穿刺部位直到出血停止。通常需要按压10-15分钟以达到止血效果。由于出现了肿胀，患者可能无法对穿刺部位施加充分的压力。

对于人工血管植入 后两周内进行透析的情况，一些透析室成功地采用了以下做法：

- 利多卡因局部浸润
- 在穿刺期间防止人工血管移动
- 迅速干净的穿刺
- 小号针头（17号）
- 整个透析过程中保持200-250毫升/分钟的血流量
- 低剂量肝素

**提醒列表**

- 检查穿刺部位的任何并发症
- 评估人工血管的血流量，并确定血流方向
- 选择尽可能小和短的穿刺针
- 对穿刺部位进行消毒，切勿再接触该部位
- 每次透析更换穿刺部位
- 按照适当的角度穿刺人工血管
- 穿刺时，尽量避免穿透人工血管后壁
- 评估流入和流出穿刺针的血流量是否充足
- 拔针时，需要对人工血管穿刺部位施压非闭塞性的压力，直到出血停止

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