

# 脱细胞真皮基质与自体刃厚皮片复合移植的临床及组织学观察

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**【摘要】** 目的 观察异体脱细胞真皮基质与自体刃厚皮片复合移植修复创面的中、长期临床效果,并做组织学观察。方法 选取 23 例接受异体脱细胞真皮基质加自体刃厚皮片复合移植的患者,于术后 3、6、12、18 个月进行临床随访,并作组织学观察。结果 移植后 3、6、12、18 个月,复合皮表面平滑,无明显瘢痕增生及色素沉着现象,柔软有弹性,关节部位活动自如。组织学观察接近正常皮肤形态。结论 异体脱细胞真皮基质与自体刃厚皮片复合移植后愈合创面表面光滑,平整柔软,无明显挛缩,关节活动自如,未见明显排汗现象,可作为修复创面的良好选择。

**【关键词】** 脱细胞真皮基质; 复合移植; 组织学观察

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风险、提高手术安全性、利于术后顺利康复,术中使用加温的肿胀液是值得提倡的。如果术中未使用加温的肿胀液,则需对受术者进行术后的留观监护。但需要提出的是由于本研究对象数量偏小,尚需大样本资料研究进一步印证。

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## Histologic analysis and long-term effect of acellular dermal matrix combined with autologous thin split-thickness skin graft

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**[Abstract] Objective** To evaluate the long-term therapeutic effect and histologic result of ADM combined with autologous thin split-thickness skin graft. **Methods** 23 patients were treated with acellular dermal matrix (ADM) combined with autologous thin split-thickness skin graft. The patients were followed up at 3, 6, 12, and 18 months after operation. The histological analysis was also performed. **Results** 3, 6, 12, 18 months after operation, the composite skin grafts became smooth with no hypertrophic scar and hyperpigmentation. It was soft and elastic. The joints could move randomly. The histologic study showed the composite skin graft had a similar appearance as the normal skin. **Conclusion** As for the treatment of wound, the composite skin graft with ADM is smooth and soft with good elasticity after transplantation, but it has no perspiration.

**[Key words]** Acellular dermal matrix; Composite graft; Histologic analysis

1995 年 Wainright<sup>[1]</sup> 首次将脱细胞真皮基质 (acellular dermal matrix, ADM) 与自体刃厚皮片复合移植应用于大面积烧伤创面, 获得较满意疗效后, 即被广泛应用于创面修复。很多学者报道了复合皮片成活后半年内的临床效果及组织学观察, 认为复合皮的临床效果同自体中厚皮片移植<sup>[2-6]</sup>。我们观察了 23 例异体 ADM 与自体刃厚皮片复合移植后中、长期的临床效果, 并做了组织学观察。

### 1 资料与方法

#### 1.1 病例来源

本组 23 例, 男 17 例, 女 6 例。年龄 4.2 ~ 45 岁, 平均年 3.7 岁。19 例关节部位瘢痕挛缩畸形, 3 例体表巨痣, 1 例瘢痕疙瘩。23 例均为 2007 年 3 月至 2009 年 3 月于山东大学附属省三医院烧伤整形外科就诊, 且因移植自体中厚或全厚皮源受限而采用异体 ADM 的患者, 使用异体 ADM 平均面积为 173.0 cm<sup>2</sup>。

#### 1.2 手术方法

采用二步法<sup>[6]</sup>, 于瘢痕挛缩畸形部位做瘢痕切除松解, 巨大体表肿物者做全层切除, 彻底止血, 将 ADM (J-1 型, 北京桀亚莱福生物技术有限公司) 无张力移植于创面, 尽量不拉开网孔, 周边以可吸收线缝合固定于创缘皮下, 上覆异体皮并打包固定, 术后 10 ~ 12 d 移植自体刃厚皮片。

#### 1.3 随访观察

患者出院后均行抗瘢痕治疗半年, 并坚持功能锻炼, 出院后 3、6、12、18 个月随访。对 2 例术后 12 个月的病例, 在征得患者本人同意的前提下, 取复合皮标本行 HE 染色, 与同一患者切除的瘢痕及瘢痕

附近的正常皮肤对比, 观察成纤维细胞、血管内皮细胞的形态、分布、数量, 以及炎性细胞的种类及数量, 观察复合皮的基底膜形态及表皮大体形态。

### 2 结果

#### 2.1 术后随访

术后 3 个月随访时, 复合皮边缘均可见轻微的瘢痕增生, 但整体外观平滑; 6 个月时周缘的瘢痕已不明显, 复合皮光滑、柔软、有弹性, 无明显瘢痕增生及色素沉着, 关节部位活动自如, 有皱褶; 12、18 个月同 6 个月时, 外观及功能无明显变化。整个随访过程中复合皮未有明显排汗现象, 稍显干燥, 触觉及痛温觉均次于正常皮肤 (图 1~3)。

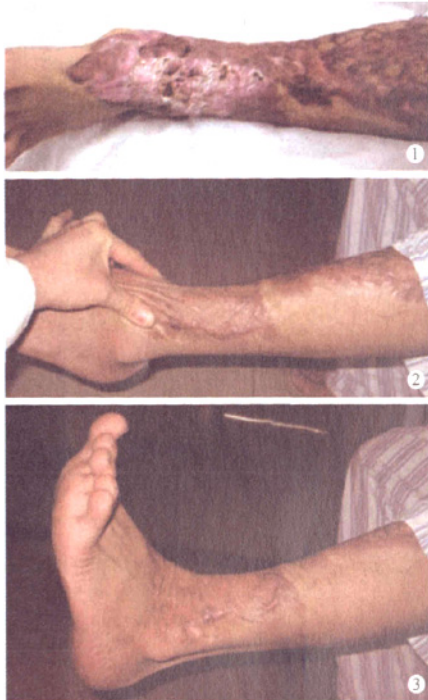
#### 2.2 组织学观察

ADM 与自体刃厚皮片复合移植 12 个月, HE 染色组织学观察胶原纤维排列整齐, 成纤维细胞及血管内皮细胞均匀贯穿于胶原框架中, 并可观察到丰富的血管网, 表皮、真皮连接处可观察到连续的波浪状基底膜, 表皮细胞分层明显; 复合皮中的炎性细胞主要为淋巴细胞, 其数量、形态与正常皮肤接近, 未见明显粒细胞、巨噬细胞浸润 (图 4~6)。

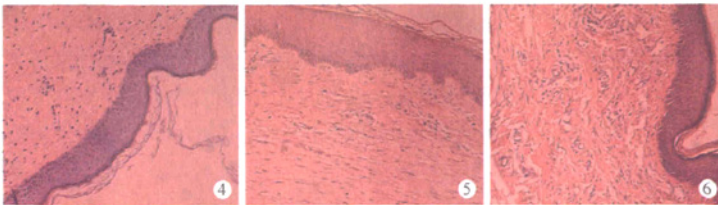
### 3 讨论

通过临床随访我们发现, 移植后 3 个月, 复合皮表面光滑, 边缘有轻微的瘢痕增生现象, 6 个月时周缘的瘢痕已不明显, 6~18 个月复合皮光滑、柔软、有弹性, 无明显瘢痕增生及色素沉着, 关节部位活动自如, 有皱褶。整个随访过程中复合皮无明显排汗现象, 稍显干燥, 有痛、温觉及触觉, 但弱于正常皮肤。

Wong 等<sup>[7]</sup> 通过动物实验获取 ADM 移植后 3、7、14 d 时的组织学标本, 观察 ADM 中成纤维细胞、



**图 1** 患者男, 21 岁, 全身多处烧伤后瘢痕, 左踝关节处高度增生性瘢痕 **图 2,3** 瘢痕大部分切除, ADM 与自体刃厚皮片复合移植, 复合皮成活良好, 术后 18 个月, 复合皮无明显挛缩现象, 表面平滑, 柔软, 可捏起, 活动时各个方向均有皮肤皱褶出现, 皮肤感觉功能存在但弱于正常皮肤, 踝关节活动自如  
**Fig 1** Male, 21-year-old, extensive burn scar with severe hypertrophic scar around the left ankle **Fig 2,3** Most of the scar was excised and the wound was covered by composite graft of ADM and thin split-thickness skin graft. The composite skin graft survived completely. 18 months later, the composite graft was smooth and soft with no contracture. The ankle joint can be moved randomly with skin fold. The skin sense existed, but not as good as the sense of normal skin



**图 4** 颈部正常皮肤, 胶原纤维排列整齐, 表皮细胞分层明显, HE × 10 **图 5** 颈部 ADM 与自体刃厚皮片复合移植后 12 个月, 可见复合皮内胶原纤维排列整齐, 成纤维细胞及血管内皮细胞均匀贯穿于胶原框架中, 以淋巴细胞为主的少量炎性细胞散在分布, 表皮、真皮连接处可观察到连续的波浪状基底膜, 表皮细胞分层明显, 接近正常皮肤形态, HE × 10 **图 6** 稳定期瘢痕切片, 可见瘢痕中胶原纤维粗大、排列紊乱, 成纤维细胞散乱分布, 血管结构丰富, 表皮与真皮连接处基底膜不明显, HE × 10  
**Fig 4** Normal skin; collagenous fibers are arrayed in order and epidermis is stratified, HE × 10 **Fig 5** 12 months after composite graft implantation: the collagenous fibers were arrayed in order with fibroblasts and endothelial cells spreading in it. Few inflammatory cells, mainly lymphatic cells, were sporadic. Wavy basement membrane could be seen between epidermis and dermis, epidermis was also stratified, HE × 10 **Fig 6** Mature cicatrix; the thick collagenous fibers were arrayed unregularly with abundant blood vessels and fibroblasts. The basement membrane was not obvious, HE × 10

内皮细胞等宿主细胞的长入过程, 发现宿主对 ADM 的反应类似于正常的创面愈合过程。姜笃银等<sup>[8]</sup>通过动物实验, 发现异体 ADM 仅在移植后早期 (< 术后 8 周) 有中度炎性/免疫反应, 与中厚断层自体皮片对照比较, 多项指标接近。我们获取 ADM 与自体刃厚皮片复合移植后 12 个月的标本, 做 HE 染色观察, 证实复合皮中胶原纤维的形态及排列、成纤维细胞与血管内皮细胞的分布与密度、基底膜的形态及表皮细胞的分层排布均接近正常皮肤, 而与瘢痕明显不同。

综上所述, 异体 ADM 与自体刃厚皮片复合移植后中、长期, 复合皮愈合创面表面光滑, 平整柔软, 无明显挛缩, 关节活动自如, 未见明显排汗现象; 组织形态接近于正常皮肤, 因此我们认为在不宜放置扩张器, 以及皮瓣转移等手术修复的创面, ADM 与自体刃厚皮片复合移植可作为修复创面的一种良好选择, 但 ADM 制作成本高, 使其应用有一定的局限性。

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