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Changes to the Nails after Transplanting the Upper Extremities

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Introduction

The germinal matrix, which makes up the majority of the nail bed, as well as the sterile matrix to a lesser extent, are all sources of the nail's development. In the event that the whole nail and nail bed require rebuilding, the strategy and procedure for a composite nail, nail bed, hyponychium and perionychium transplant are described in this article. A case involving the removal of a nail bed junctional nevus and repair using a nail unit matrix transplant is given.

Description

More than 80 patients have benefited from upper extremity allotransplantation (UEA), which is a more popular kind of vascularized composite allotransplantation. Along with the skin, these allografts also contain the nail unit, a specialised epithelial appendage that might be the site of transplant rejection. We describe a case of a UEA patient who had onychomadesis, or the shedding of the nail plate beginning at the proximal nail bed, as an initial sign of graft rejection. On this time, we looked back at the nail alterations we noticed in a group of eight UEA patients who had grafts and were monitored in our hospital since 1998. (Mean follow-up period of 9.75 years). We also looked at pertinent research documenting nail changes in UEA participants. The importance of these alterations in the context of UEA is briefly discussed, with an emphasis on onychomadesis, a finding typically associated with graft rejection in this particular situation [1-3].

This is the most recent in a line of findings in people who have received stem-cell transplants (SCT) showing donor cells end up in nonhematopoietic tissues such the stomach, buccal mucosa, liver and potentially muscle. Although the current study conclusively shows that donor DNA is absorbed into nails, we should be cautious in how we interpret this. Whether and how SCT may recreate non-hematopoietic tissues are subjects of debate. Fluorescence in situ hybridization (FISH) methods cannot reliably rule out the presence of hematopoietic cells contaminating epithelial tissue, nor can they rule out the possibility of fusion of hematopoiesis-derived nuclei in tetraploidal nonhematopoietic cells and not all studies have been successful. The question of whether the donor cells in these tissues came from hematopoietic stem cells or other progenitors that were transferred during the graft remains unanswered in these human investigations. For instance, mesenchymal stromal cells transplanted can serve as a home for several tissues. In the current study, the presence of donor DNA in nonvascular appendages like nails appears to rule out blood cell contamination. Furthermore, despite the possibility that the vascular nail bed might present, the researchers searched for and were unable to locate HTLV-1 DNA in the fingernails of patients with HTLV-1 leukemia-lymphoma. This confirms that blood cells (or at least lymphocytes) do not contribute DNA to fingernails. Could the donor DNA-containing cells be fused recipient keratinocytes with tetraploidal nuclei? In the three cases with more than 50% donor DNA, probably not. As a result, we are forced to draw the conclusion that, at least rarely, completely donor-derived nonhematopoietic cells can contribute significantly to the recipient's nail keratinocytes [4].

The sample size of this study makes it impossible to pinpoint the elements that encourage nonhematopoietic donor cells to engraft. Since myeloablative transplants result in the loss of nails, it would seem logical that these transplantation regimens would offer more possibilities for donor cells to produce new nails. In fact, myeloablative SCT was present in all of the patients with identified donor DNA. Contrarily, acute and chronic GVHD (as processes that cause tissue damage) did not seem to be a need for donor nail chimerism—some of the largest donor DNA contributions were seen in patients with grade 0-I acute and minimal chronic GVHD. If bone marrow was the source of the donor cells in 8 of the 9 patients who tested positive for donor DNA, would peripheral blood transplants also include nonhematopoietic progenitors?

What broader effects may this finding have? In fact, none of the patients in this trial experienced persistent GVHD damaging the nails, suggesting that donor cells may replace recipient tissues and minimise GVHD in the chimaera tissue. Tissue regeneration from SCT is still a ways off, though, until more is understood about the cells that contribute and the prerequisites for recreating the integument [5].

Conclusion

The inherent variety in nail form and colour in various populations explains why the prevalence rate of various nail modifications in kidney transplant recipients varies greatly from one area to another. Onychomycosis, Muehrcke's nail and leuconychia are more common in KTR in our area than in the general population. In Egyptians, absent lunula is a common variation.

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