## Options and Outcomes in the Management of Corneal Limbal Stem Cell Deficiency

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### Disclosure
Anthony J. Aldave, M.D.
- Consultant (ad hoc)
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### Management of Bilateral LSCD
**Lecture Outline**
- Keratolimbal allografts
- Oral mucosal epithelial autografts
- Keratoprostheses
Management of Bilateral LSCD
Lecture Outline
• Keratolimbal allografts
• Oral mucosal epithelial autografts
• Keratoprosthesis

Management of Bilateral LSCD
Keratolimbal Allografts
Indications
• All 26 studies were noncomparative case series
  • No randomized clinical trials
• 31% (8/26) of studies surveyed bilateral severe or total LSCD alone
  • Keratolimbal allograft (KLAL) with systemic immunosuppression in 75% (6/8)
    • Chemical or thermal burn (n = 67)
    • Aniridia (n = 40)
    • Stevens-Johnson syndrome (n = 27)


Management of Bilateral LSCD
Keratolimbal Allografts
Vision
• Improvement in CDVA > 2 Snellen lines
  • 56% (14/25) of eyes
  • 67% (10/15) of eyes
  • 81% (13/16) of eyes
  • 90% (9/10) of eyes


Management of Bilateral LSCD
Keratolimbal Allografts    Survival


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Keratolimbal Allografts    Survival
Management of Bilateral LSCD

Lecture Outline

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Management of Corneal LSCD

Oral Mucosal Epithelial Autograft


Management of Bilateral LSCD

Lecture Outline

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Boston Keratoprosthesis Indications

68 of 173 Procedures

- SJS
- Graft failure
- Chemical injury
- Corneal scarring/vascularization
- MMP
- Aniridia
- MMC / Topical medication toxicity
- Cicatrizing conjunctivitis
Management of Bilateral LSCD
Comparative Visual Outcomes

- Keratolimbal allografts
  - Post-op VA > 20/200 in 44% of eyes\(^1,2\)

- COMET
  - Pre-op VA > 20/200 in 0% of eyes
  - Post-op VA > 20/200 in 27% of eyes at 3-34 months\(^3\)

- Boston keratoprosthesis
  - Pre-op VA > 20/200 in 7% of eyes
  - Post-op VA > 20/200 in 77%, 88% and 86% of eyes at 1, 3 and 5 years


Management of LSCD
Boston Kpro vs KLAL Retention vs Survival


Management of LSCD
Boston Kpro vs COMET Retention vs Survival


Management of LSCD
Boston Keratoprosthesis Complications

| TABLE 3. Postoperative Complications and Secondary Surgical Procedures for Patients With and Without LSCD |
|---------------------------------------------------------------|-----------------|---------------|-----------------|-----------------|-----------------|-----------------|
| All (LSCD + Non-LSCD) | LSCD | Non-LSCD | Fisher Exact Test P |
| No. eyes (procedures) | 149 (173) | 54 (68) | 95 (105) | 0.042 |
| Retropathic membrane | 72 (48.3) | 20 (37.0) | 52 (54.7) | 0.28 |
| YAG membrane removal | 51 (34.2) | 15 (27.8) | 36 (37.8) | 0.28 |
| Surgical membrane removal | 10 (6.7) | 3 (5.6) | 7 (7.4) | 0.055 |
| Persistent epithelial defect | 54 (36.2) | 27 (50.0) | 27 (28.6) | 0.013 |
| Tarsorrhaphy | 29 (19.5) | 19 (35.3) | 10 (10.5) | 0.00005 |
| Elevated IOP (>25 mm Hg) | 24 (16.1) | 7 (13.0) | 17 (17.8) | 0.49 |
| Tube shunt | 7 (4.7) | 0 (0) | 7 (7.4) | 0.049 |
| CME | 22 (14.8) | 8 (14.8) | 14 (14.7) | 0.00 |
| Intravitreal injection | 12 (8.1) | 4 (7.4) | 8 (8.4) | 0.00 |

Management of LSCD
Boston Keratoprosthesis Complications

| TABLE 3. Postoperative Complications and Secondary Surgical Procedures for Patients With and Without LSCD |
|---------------------------------------------------------------|-----------------|---------------|-----------------|-----------------|-----------------|-----------------|
| All (LSCD + Non-LSCD) | LSCD | Non-LSCD | Fisher Exact Test P |
| No. eyes (procedures) | 149 (173) | 54 (68) | 95 (105) | 0.059 |
| Sterile corneal stromal necrosis | 22 (14.8) | 12 (22.2) | 10 (10.5) | 0.039 |
| Keratoprosthesis replacement | 27 (18.1) | 9 (16.7) | 18 (18.9) | 0.83 |
| Corneal infiltrate | 20 (13.4) | 11 (20.4) | 9 (9.5) | 0.08 |
| Rebral detachment | 18 (12.1) | 3 (5.6) | 15 (15.8) | 0.073 |
| Repair of rebral detachment | 12 (8.1) | 2 (3.7) | 10 (10.5) | 0.21 |
| Sterile vitritis | 15 (10.1) | 2 (3.7) | 13 (13.7) | 0.06 |
| Vitreous tap and intravitreal injections | 12 (8.1) | 0 (0) | 12 (12.6) | 0.004 |
| Endothelialitis | 2 (1.3) | 0 (0) | 2 (2.1) | 0.53 |
Management of Bilateral LSCD

Conclusions

• **Boston keratoprosthesis**

Visual Outcomes

• Provides superior visual outcomes when compared to the published literature on allogenic keratolimbal and oral mucosal epithelial transplantation

Retention

• Retention rate at 5 years is higher than survival rate of keratolimbal allografts and oral mucosal epithelial autografts

Complications

• Avoids expense and risks associated with systemic immunosuppression

• Only complication significantly more common in eyes with LSCD compared to eyes without is persistent epithelial defect
Management of Bilateral LSCD

Conclusions

• The Boston keratoprosthesis is the evidence-based procedure of choice for managing bilateral limbal stem cell deficiency

Thank You for Your Attention!

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