A MANUAL OF
MICROVASCULAR SURGERY

TISSUE TRANSFER TECHNIQUES

Author:

Dr. Hosi M. Bhathena
M.S., M.S., M.CH.

Plastic and Reconstructive & Maxillofacial Surgeon
Tata Memorial Hospital & Center, Mumbai.

Honorary Plastic Reconstructive & Maxillofacial Surgeon
Balabhai Nanavati Hospital & Medical Research Center, Mumbai
Masina General Hospital, Mumbai.
The development of Microvascular surgery took place in the last two and a half decades following fine sutures, needles and instruments. However, real progress came about when the knowledge of previously described island flaps by Esser and others, have added advantage with the knowledge of myocutaneous and other composite flaps. Further understanding of detail anatomy of the circulation by G. Ian Taylor have contributed to varieties of flaps. A success of microvascular surgery is a combination of the knowledge of anatomy and good surgical technique of anastomosing small vessels upto the level of 0.8 millimeter.

Efforts made by the Author is to provide the information of the technique of anastomosis under magnification and detailed description of various flaps will make any reconstructive surgeon versatile in majority of the situations.

— Dr. S.R. Tambwekar
Chief Plastic Surgeon,
Bombay Hospital & Institute of Medical Sciences, Mumbai
Sir H.N. Hospital, Mumbai
Ex-Prof. of Plastic Surgery, KEM Hospital &
G.S. Medical College, Mumbai
# CONTENTS

1. **HISTORY** ............................................................................................................ 7
2. **MICROVASCULAR INSTRUMENTS AND SUTURE MATERIAL** .......................... 8
3. **MAGNIFICATION DEVICES** .............................................................................. 9
4. **EXPERIMENTAL MODELS** ............................................................................. 10
   A. Model I : Latex diaphragm
   B. Model II : Silicone rubber tubes
   C. Model III : Human Placenta
   D. Model IV : Animal Rat
      1. Anatomy
      2. Preparation and anesthesia
      3. Pharmacologic agents
5. **BASIC SUTURING TECHNIQUE** ..................................................................... 13
   A. End to End Arterial Anastomosis
      1. Exposure and isolation
      2. Tissue handling under magnification
      3. Application of vessel clamps
      4. Transection
      5. Preparations of vessel ends
      6. First sutures
      7. Anterior wall sutures
      8. Turning the vessel
      9. Posterior wall sutures
     10. Removal of vessel clamps
     11. Patency test
   B. End to End Venous Anastomosis
   C. End to Side Anastomosis
   D. Vessel Transplant
6. ANATOMY, INDICATIONS AND TECHNIQUES IN MICROVASCULAR TISSUE TRANSFER

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Latissimus Dorsi Flap</td>
</tr>
<tr>
<td>B</td>
<td>Deep Circumflex Iliac Flap</td>
</tr>
<tr>
<td>C</td>
<td>Radial Forearm Flap</td>
</tr>
<tr>
<td>D</td>
<td>Free Jejunal Transfer</td>
</tr>
<tr>
<td>E</td>
<td>Groin Flap</td>
</tr>
<tr>
<td>F</td>
<td>Fibula Transfer</td>
</tr>
<tr>
<td>G</td>
<td>Scapular and Parascapular Flap</td>
</tr>
<tr>
<td>H</td>
<td>Serratus Anterior Flap</td>
</tr>
<tr>
<td>I</td>
<td>Rectus Abdominis Flap</td>
</tr>
<tr>
<td>J</td>
<td>Dorsal Foot Flap – Dorsalis Pedis Artery Flap</td>
</tr>
<tr>
<td>K</td>
<td>Toe Transfer – Total and Segmental</td>
</tr>
<tr>
<td>L</td>
<td>Calf Flap</td>
</tr>
</tbody>
</table>

7. PITFALLS IN SUCCESSFUL ANASTOMOSIS

8. BIBLIOGRAPHY