EVALUATION OF ISOLATED OMENTAL GRAFT- HOMOLOGOUS & AUTOLOGOUS: AN EXPERIMENTAL STUDY

Govind Trivedi¹, Mahesh Gupta²

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SUMMARY: This is an experimental study performed in normal limbs of 20 mongrel dogs divided in 2 groups:

Group A	10 dogs
Group B	10 dogs

A 5x5 cm piece of omentum was resected out by laparotomy. A sub-fascial tunnel 5 cm in length was created in the mid thigh of each dog. Omental piece from dog of group A was transplanted in subfascial tunnel of the same dog (Autologous Omental Graft). Omental piece from dog of group A was transplanted in subfascial tunnel of the corresponding dog of group B (Homologous Omental Graft). Re-exploration of the graft site was done after 3 weeks. In case of autologous Grafting the omentum was found to be well adhered to the underlying tissues in all the 10 cases. on H.P.E. neo-vascularisation was seen in and around the graft. In case of homologous grafting. The omental graft was found to be acceptable in 3 out of 10 cases. By virtue of this study, it seems that the use of isolated omental graft can be a ray of hope in the direction of re-vascularisation of ischaemic limb.

INTRODUCTION: The exact modality of treatment for lower limb ischaemia due to peripheral arteriosclerotic occlusive diseases eg. Buerger's Disease has still remained unsolved. The current methods of improving impaired blood flow to the extremities eg. Endarterectomy, venous by pass, elicit poor results. The direct arteriolar surgery is not feasible for these patients because of diffuse occlusion of small and medium sized vessels of the extremities and poor distal run off. The direct palliative surgery like Sympathectomy which has been routinely employed, relieves vasospasm but does not increase blood flow to the ischaemic muscle, so that many patients return with recurrence of agonizing pain. Amputation is the last conservative approach to save the patient life.

By virtue of its unique property of arteriolisation, Omental transfer seems to be the answer towards replenishment of limb nutrition for patient in imminent danger of amputation. Casten, Aldey et al in 1972 proposed Omentopexy. In this omentum was tailored to a sufficient length permitting it to reach the ischaemic limb while maintaining an adequate vascular supply through a pedicle. On the basis of encouraging results with omentopexy and keeping in mind the revascularisation property of omentum, the present study was carried to study autologous and homologous free omental grafts.

MATERIAL AND METHODS: 20 adults mongrel dogs of either sex weighing 7-15 kg were selected. The dogs were divided in 2 groups:

Group A	consisted of 10 dogs
Group B	consisted of 10 dogs

- (a) In group A, free omental pieces were taken out and grafted on the hind limb of the same dog (Autologous Transplantation).
- (b) In group B, free omental pieces taken from dogs of group A were grafted on the hind limb of the corresponding dogs of group B (Homologous Transplantation).

Dogs were anaesthetised by intraperitoneal injection of Sodium Pentothal in the dose of 30mg/kg body wt. Endotracheal intubation was done and connected to the mechanical respirator.

Laparotomy was performed by upper midline incision. Greater Omentum was identified and 5x5 cm piece was resected. A 5 cm long subfascial tunnel was created in the hind limb of the dog, omental piece was transplanted in that tunnel and secured to the underlying muscle with absorbable suture material.

The dogs were re-examined at the end of 3 weeks under anaesthesia. The site of omental transplantation was reexplored. Apart from gross examination, biopsy tissue was taken from the graft site along with underlying muscle tissue for Histopathological examination.

DISCUSSION: In the recent years the concept of Buerger's disease (thrombo-angitis-obliterans) as a clinical entity and its management has remained controversial and various regimes of treatment often elicit poor results.

One of the unique properties of Omentum is its unlimited capacity to increase the vascular supply by forming anastomotic tissue. This has been attributed to the discovery of a lipid fraction from omentum which has angiogenic properties.

In our study we have tried to make use of the above mentioned fact in normal (non-ischaemic limbs).

Successful transplantation of the omental graft would depend on the donor and recipient sharing a number of histocompatible gene, the most strong is the MHC (major histocompatibility complex). This codes for the synthesis of certain protein antigens such as HLA-A, HLA-B, HLA-DR. These stimulate T-helper (TH) cells to help cytotoxic T (Tc) cells to destroy the target graft cell.

Our experimental studies have shown that the Autologous graft survived in all the 10 cases. but the Homologous graft survived in only 3 cases. Even a HLA mismatched graft is taken up. The survival of omental allograft is still not understood and this might be due to some unknown immunological unresponsiveness.

CONCLUSION: Since it is unlikely that man will give up his habit of smoking and the role of other treatment modalities being controversial. The technique of grafting a isolated piece of omentum to increase the local blood supply may be last answer.

Considering the fact that the omental graft was well accepted with features of neovascularisation around the graft, it can be a ray of hope in treatment of ischaemic limb and prevention of amputation and growing disablement.

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Graft site	Status
1. Wound	
(a) - Clean - Healthy - Healed with primary intention	+ in 8 dogs.
(b) - Infected - Gaping at the stitch line - Healed with Secondary intention	+ in 2 dogs.
2. Omental graft	
(a) Fixity to the underlying muscle	+ in 10 dogs.
(b) Reduction of omentum size to 2 x 2 cm (40% of original size)	+ in 10 dogs.

Table No. 1: Observations on gross examination of the omental graft site in 10 dogs [Autologous]

Graft site	Status
1. Oedema fluid	+ in 6 dogs
2. Inflammatory cells (Polymorphs predominant)	+ in 10 dogs
3. Vascular congestion	+ in 10 dogs
4. Neovascularisation	+ in 10 dogs
5. Necrosis and infarction	- in 10 dogs

Table No. 2: Observations on Histopathological examination of the omental graft site in 10 dogs [Autologous]

Graft site	Status
1. Wound	
(a) - Clean - Healthy - Healed with primary intention	+ in 6 dogs.
(b) - Infected - Gaping at the stitch line - Healed with Secondary intention	+ in 4 dogs.
2. Omental graft	
Fibro fatty tissue fixed to the under lying muscle	+ in 3 dogs.
Reduction in size to 2 x 2 cm (40% of original size)	+ in 3 dogs.
Necrosed tissue with accumulation of serosanguinous fluid	+ in 7 dogs
Table No. 3: Observations on gross examination of the omental graft site in 10 dogs [Homologous]	

Graft site	Status
Necrosis and infraction with no evidence of omentum.	+ in 7 dogs
Inflammatory cells (lymphocytes predominant)	+ in 7 dogs
Neovascularisation with mild inflammation (Polymorphs predominant)	+ in 3 dogs
Vascular congestion	+ in 3 dogs
Table No. 4: Observations on Histopathological examination of the omental graft site in 10 dogs [Homologous]	

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AUTHORS:

1. Govind Trivedi
2. Mahesh Gupta

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of General Surgery, Rama Medical College, Mandhana, Kanpur.
2. Associate Professor, Department of General Surgery, Rama Medical College, Mandhana, Kanpur.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Govind Trivedi,
Flat 206-A, Shiva Apartment,
Sarvoday Nagar, Kanpur.
Email – govind_trivedi03@yahoo.co.uk

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