

Insulating effect of thermal barrier bag (OrganPocket®) on second warm ischemic time during living renal transplantation
:comparison with direct cooling cases

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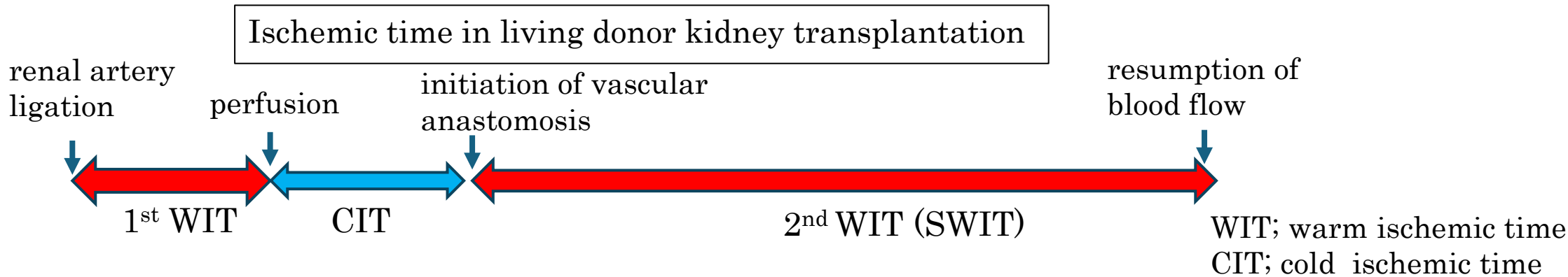
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I have no conflict of interest to disclose.

Introduction



- During SWIT, performing anastomosis of the renal artery and vein without cooling measures exposes kidney to temperatures above the metabolic threshold, which may negatively impact graft outcomes.
- Conventionally, during SWIT, the surgeon cools the renal graft by applying an ice-cold solution to it.
- OrganPocket[®] (SCREEN holdings Co.Ltd. Japan), an insulated gel bag for renal transplantation was recently launched.



There have been reports that use of the insulated bags has reduced the surface temperature of renal grafts during SWIT to less than 20 °C, but no reports have yet shown a difference between this and conventional cooling methods.



OrganPocket[®]

Patients and Methods

Patients who underwent living donor renal transplantation at our department were divided into the following two groups.

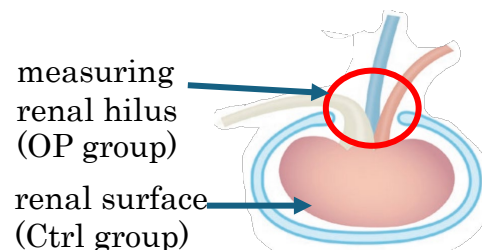
- patients with Organ Pocket[®] (OP group)
- patients without Organ Pocket[®] (Ctrl group)

cooling method

OP group: No cooling maneuvers for the time between vascular anastomosis and resumption of blood flow, with an Organ pocket

Ctrl group: ice-cold lactated Ringer's solution was applied externally by syringe to the gauze-wrapped kidneys every 1-3 minutes.

The temperature change during SWIT was measured every 5 minutes using thermography.



Recipient characteristics

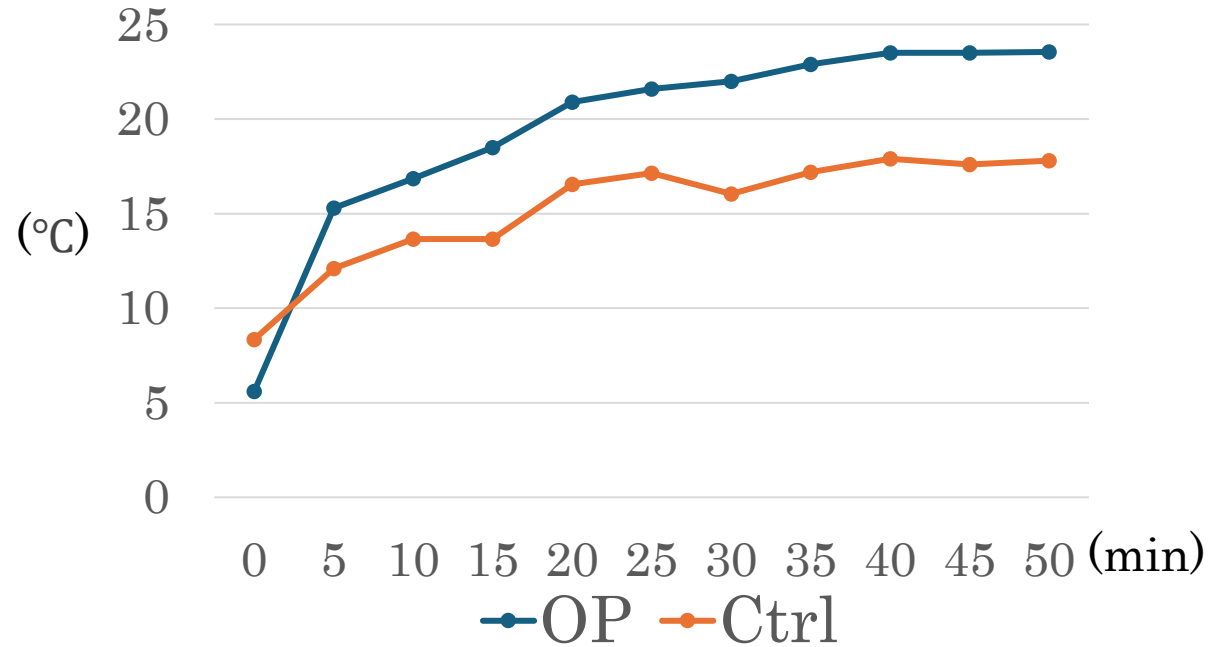
	OP group (n=16)	Ctrl group (n=16)	Pvalue
Age (years)	44.5(38.75-53.25)	43(35-53)	n.s
Sex (male)	8	7	n.s
BMI (kg/m ²)	21.2(19.1-24.5)	22.6(18.0-25.7)	n.s
HD duration (months)	2 (0-10)	11 (4.5-22)	n.s
ABO incompatible	5	1	n.s

Living donor characteristics

	OP group (n=16)	Ctrl group (n=16)	Pvalue
Age (years)	55 (49-61)	60.5 (54.5-62.5)	n.s
Sex (male)	7	6	n.s
BMI (kg/m ²)	22.2(19.8-23.5)	23.1(21.4-24.0)	n.s
Side(left)	11	10	n.s
Renal arteries	single:12 double:4	single:14 double:2	n.s

Results

Changes in temperature during SWIT



Perioperative results

	OP group (n=16)	Ctrl group (n=16)	P value
WIT(min)	3 (3-4)	3 (2-3)	n.s
CIT(min)	20 (16-25.5)	20.5 (16.5-24.75)	n.s
SWIT(min)	51.5 (44-62.5)	51 (45-54)	n.s
TIT(min)	80 (70-86.5)	77 (62.7-80.75)	n.s
Operation time (recipient) (min)	288 (223-381)	294 (250-332)	n.s
Operation time (donor) (min)	120 (107-128)	112 (104-120)	n.s
Delayed graft function	0	1 (antibody mediated rejection)	n.s
best eGFR	51.6 (44.9-59.5)	52.2 (45.1-62.0)	n.s

	OP group (n=16)	Ctrl group (n=16)	P value
(A) ambient surgical field temperature (°C)	30.5	28.2	p<0.05
(B) renal surface temperature just before resumption of blood flow (°C)	19.5 (after removal OP)	17.4	p<0.05
(A) - (B)	10.3	10.8	n.s

Discussion

- The use of Organ Pocket® effectively maintained the temperature increase below 20°C during the SWIT period, achieving similar results to conventional direct cooling methods, with over 10°C suppression compared to ambient temperature.
- There was no effect on outcome, such as delayed graft function.

	Organ pocket®	Conventional (direct cooling)
advantages	<ul style="list-style-type: none">• Easy to use• Improved temperature control reduces renal impairment.• Reduce the manpower involved in cooling	<ul style="list-style-type: none">• Low cost (cooling solution only)• Rapid cooling effect
disadvantages	<ul style="list-style-type: none">• Product costs• If the anastomosis is prolonged, attention should be paid to the temperature rise(e.g. injection of cooling liquid in the OP).	<ul style="list-style-type: none">• Manpower required for cooling operations• Temperature rises quickly if not cooled for a long period of time.• Solution dropped interferes with the surgical field.

*limitation

In clinical setting, measuring renal central temperature is difficult. As this study is a comparison of surface temperatures, deviations from the central temperature may occur (especially in the direct cooling cases).

Conclusion

- The use of OrganPocket[®] made it possible to maintain the renal graft at a low temperature during anastomosis.
- This use was considered not only effective in controlling temperature rise, but also in improving the quality of surgery, such as reducing the stress of the surgeon.