T400 Series Technical Note

Rodent Studies: Implantation of a Skin Button Connector

Preparing a Transonic® CA4 Connector for Installation into a "Rigid Cuff" to Convert into a Skin Button

In the mouse, an implanted Flowprobe maintains the best position if the cable is not disturbed by subcutaneous preparation. To do this, cut and close the skin over the Flowprobe's cable to the Probe connector at the midscapular region, leaving the Probe's CA4 connector exposed (Figs. 1, 2), instead of tunneling the connector subcutaneously.

Close the skin over the incision with 5-0 Vicryl sutures. Use a 3/4" square of Mersilene Mesh under the skin at the connector (Fig. 2) and suture the skin closed around cable (Fig. 1). This helps to fortify the skin and keep sutures from pulling out of the skin. Finally, install a skin button cuff (Fig. 3) over the CA4 connector suturing through the skin and the mesh to improve long term stability of the implant.

The wound is cleaned and the animal is allowed to recover before measurements are made. Generally, it takes 3 - 5 days to achieve a stable signal as fibrotic tissue helps to encapsulate the Probe, though the flow signal may be available as soon as one day post surgery.

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Fig. 3: Rigid cuff for CA4S Connector.

Fig. 1: The mouse is shown with the skin button positioned after surgery.

Fig. 2: Mersilene Mesh shown under skin in area prepared for button placement.

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1. Make a subcutaneous pouch to hold the Mersiline mesh (Ethicon). Placing mesh under the skin strengthens the skin so that the button can be placed long-term.
2. Place the mesh in the skin incision and try to get it to lay flat without folding back on itself (Fig. 4). Use something flat like the back side of forceps to get the mesh to lie down along the muscles. You may lift up the skin to get a view of the corners of the mesh. Put a drop of Nexaband onto the corners as a temporary anchor.
3. To place sutures to hold the skin button in place, pass a needle (24G or larger in a rat) through the skin (Fig. 5), into the mesh, perhaps into a small bit of muscle, back through mesh and then back up through the skin to exit near where one of the sets of button holes would be on the skin (Fig. 6). Do this so that the skin entrance and exit holes are a little wider than the holes in the button. In doing this, you should look into the central skin incision to see that the needle doesn't run through your cables or catheters.
4. Pass a piece of vetafil through the needle. Remove the needle so that you have the vetafil running down under the skin, through the Mersilene mesh and muscle and back up through the mesh and skin (Fig. 7).
5. Clamp the two loose ends of the vetafil with hemostats or Schwartz serrefines (that will hold these sutures together so you can approximate the other suture points (Fig. 8).
6. Repeat this procedure 3 more times for the other button holes (Fig. 9).
7. To close the incision with a purse-string, thread the four vetafil sutures through the button holes and tie the button down (Figs. 10,11). Don't tie it so tight that it is tugging on the skin or it may cut through the skin and muscle. Leave a little space for the button to move.

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Fig. 4: Mersiline mesh.

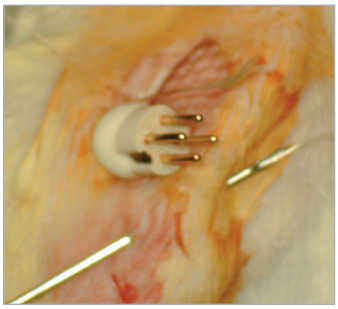

Fig. 5: Passing a needle through the skin.

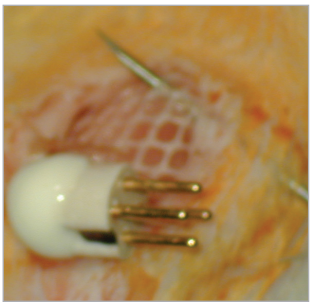

Fig. 6: The needle should pass through skin, mesh and muscle.

Fig. 7: Remove the needle leaving the suture in place.

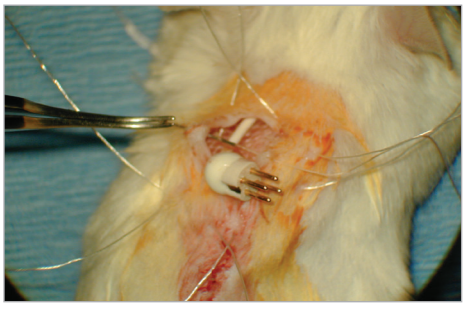

Fig. 8: Sutures placed for skin button.

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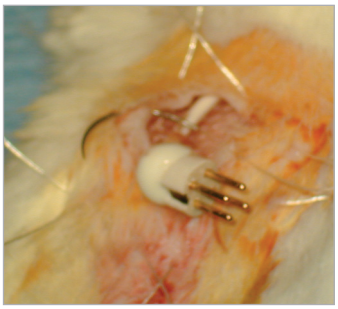

Fig. 9: Multiple sutures to hold the skin button in place.

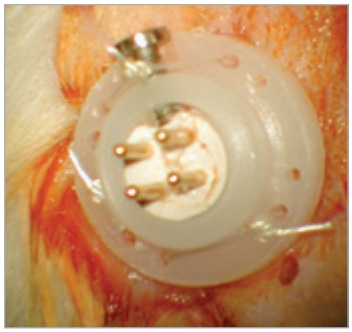

Fig. 11: Close up of skin button sutured in place.

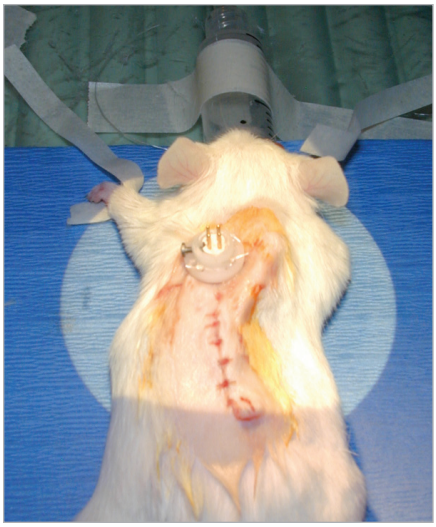

Fig. 10: Skin button sutured in place.

ACKNOWLEDGEMENT

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EQUIPMENT SOURCES

Sutures

Vetafil (synthetic, polyamide, non-absorbable suture)
S. Jackson Inc, Washington, D.C.

Skin Buttons

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AMERICAS
Transonic Systems Inc.
34 Dutch Mill Rd
Ithaca, NY 14850
U.S.A.
Tel: +1 607-257-5300
Fax: +1 607-257-7256
support@transonic.com

EUROPE
Transonic Europe B.V.
Business Park Stein 205
6181 MB Elsloo
The Netherlands
Tel: +31 43-407-7200
Fax: +31 43-407-7201
europe@transonic.com

ASIA/PACIFIC
Transonic Asia Inc.
6F-3 No 5 Hangsiang Rd
Dayuan, Taoyuan County
33747 Taiwan, R.O.C.
Tel: +886 3399-5806
Fax: +886 3399-5805
support@transonicasia.com

JAPAN
Transonic Japan Inc.
KS Bldg 201, 735-4 Kita-Akitsu
Tokorozawa Saitama
359-0038 Japan
Tel: +81 04-2946-8541
Fax: +81 04-2946-8542
info@transonic.jp