A New Tool for Initial Stabilization of Pelvic Fractures: The TPOD® Trauma Pelvic Orthotic Device

Mary Kate FitzPatrick, MSN, RN

In the field of trauma care one of the more challenging injuries encountered is the severe pelvic fracture. These injuries often occur in combination with other injuries and characteristically are associated with significant internal blood loss. Trauma centers have struggled with approaches to initial stabilization of pelvic injuries. Measures to quickly minimize or tamponade blood loss from severe pelvic fractures are limited. One of the more popular methods is the "sheeting" technique. This approach involves wrapping the pelvic girdle with a bed sheet and then tightly securing the sheet in a circumferential manner to slow/stop internal bleeding. Use of pneumatic antishock garment is a clinical device that has been indicated in the initial stabilization of pelvic fractures. Pneumatic antishock garment use in general have decreased in recent times and accessibility to these devices is limited in some areas.

More recently some trauma centers have instituted application of external fixation devices during the initial resuscitation phase in the emergency department. Ideally this procedure requires the immediate presence of an Orthopedic Surgeon. The equipment costs and complication risks with this procedure in the setting of the emergency department may be significant. In addition the time for application is vari-

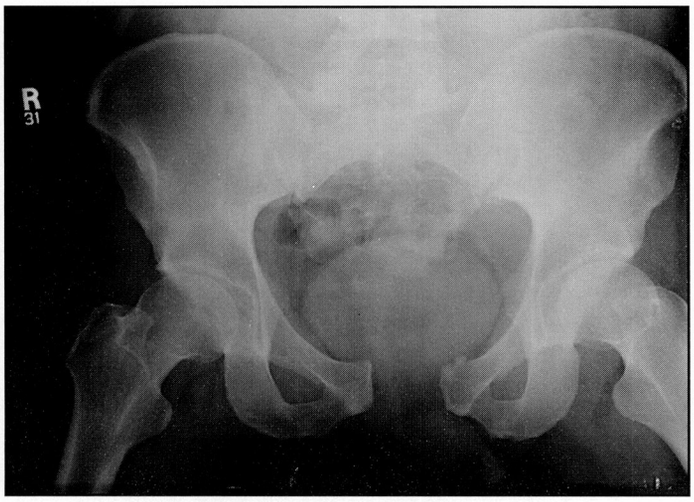

Figure 1. X-ray of pelvic fracture pre-application of TPOD® device.

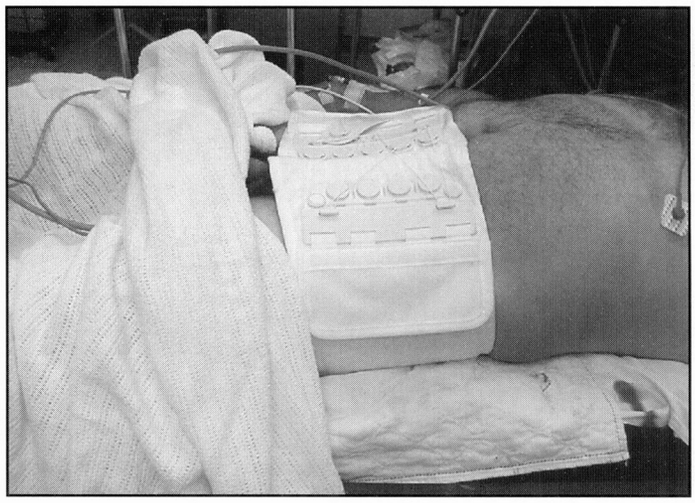

Figure 3. Device applied with circumferential tension.

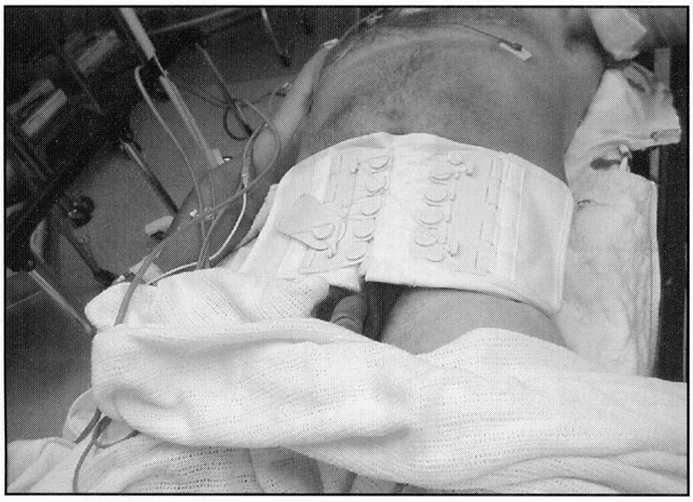

Figure 2. Placing TPOD® device with pulley in place.

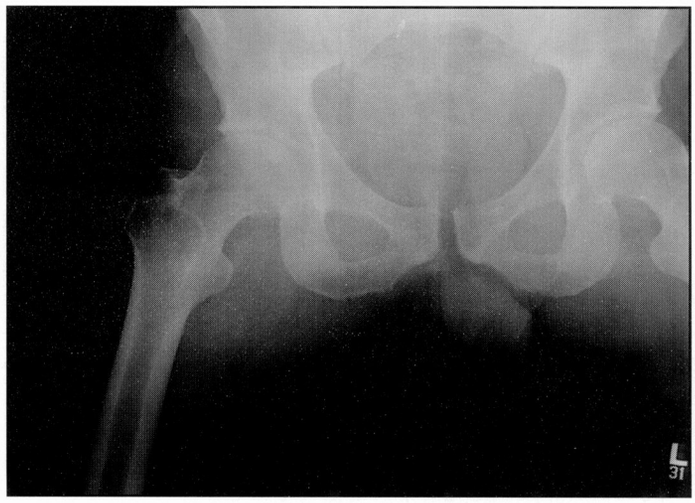

Figure 4. X-ray of pelvis post-application of TPOD® device.

able and may limit ability for some radiographic studies. Pelvic C-Clamps are also one of the options successfully employed by trauma centers in the initial management of pelvic fractures.

In 1999, under the development leadership of Dr. Charles Reinert, MD, Vice Chairman of the Department of Orthopedic Surgery at the University of Texas, a company called Bio-Cybernetics International, developed a pelvic corset device called the TPOD® (Trauma Pelvic Orthotic Device). This device is a simply designed two piece unit; one piece is a support binder made of radiolucent fabric that has velcro attachment points;the second piece of the device is the power unit. The power unit is a hard plastic device that is essentially a string pulley system. The power unit/pulley system affixes to the support binder at the velcro attachment points. Once the support binder is properly sized to the patient and positioned properly, the pulley system is attached and then tightened over the pelvis to the desired tension to stabilize the pelvic girdle. (See Figure 3) The TPOD® will not interfere with evaluation of the trauma patient. X-rays, CT scans, angiography, abdominal ultrasound, and peritoneal lavage can all be safely completed with the TPOD® in place. In most situations the TPOD® can be left in place until evaluation is complete and definitive open reduction and internal fixation of the fracture can be accomplished.

The University of Pennsylvania instituted use of the TPOD® in early 2000. After the units were received we invited a representative from the Bio-Cybernetics International company to lead staff in-service education programs on all of our trauma designated inpatient units. We also determined that to assure consistency, a written guideline for proper TPOD® usage needed to be developed. (see Appendix) The development of this guideline was a multidisciplinary effort that included trauma nursing, orthopedic surgery and trauma surgery. Specific nursing considerations to be aware of when using the TPOD® are addressed in the guideline. The device is meant to be a temporizing measure and if left on greater that 48 hours it requires routine skin integrity evaluation as is discussed in our guideline.

To date we have successfully placed the TPOD® on approximately 15 trauma patients. Figures 1-4 are photos pre and post TPOD® application on a patient treated at the Hospital of the University of Pennsylvania. These show the dramatic results that this device provides.

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Mary Kate FitzPatrick, MSN, RN is the Clinical Programs Administrator, Division of Traumatology & Surgical Critical Care, Hospital of The University of Pennsylvania Philadelphia, PA