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(56) Documents Cited:  
WO 2011/076640 A1 CN 200991278 Y  
CN 200963167 Y CN 002633222 Y  
US 5514155 A US 5234459 A  
US 20050187501 A1 US 20040122469 A1  
US 20030199922 A1

(58) Field of Search:  
INT CL A61B  
Other: EPODOC, WPI

(54) Title of the Invention: Radial angiography vascular closure device  
Abstract Title: Radial angiography vascular closure device

(57) A device to close a puncture site e.g. radial artery puncture site, comprising a strap, and an inflatable balloon, wherein the balloon is attached to and inflated by a sphygmomanometer. The device includes a plastic strap with fastening means. The device achieved haemostasis by compression. By using a sphygmomanometer the inflation level can be controlled to just above physiological pressure.

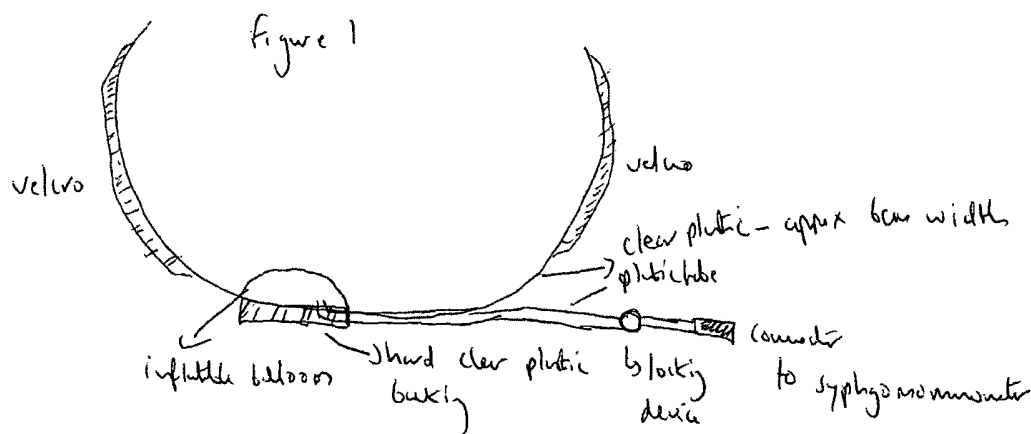


Figure 1

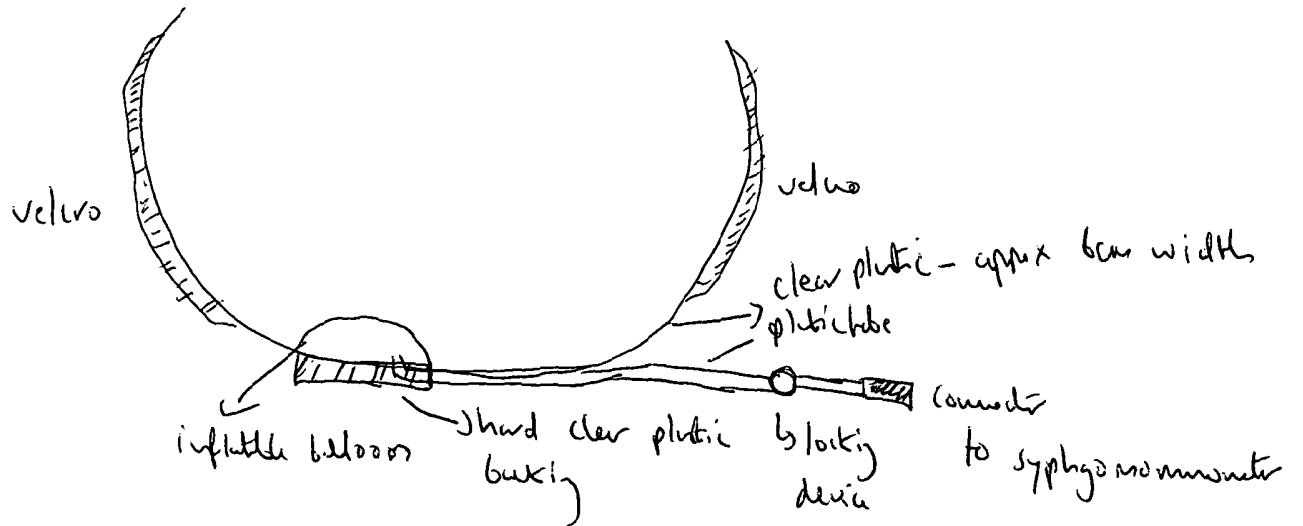
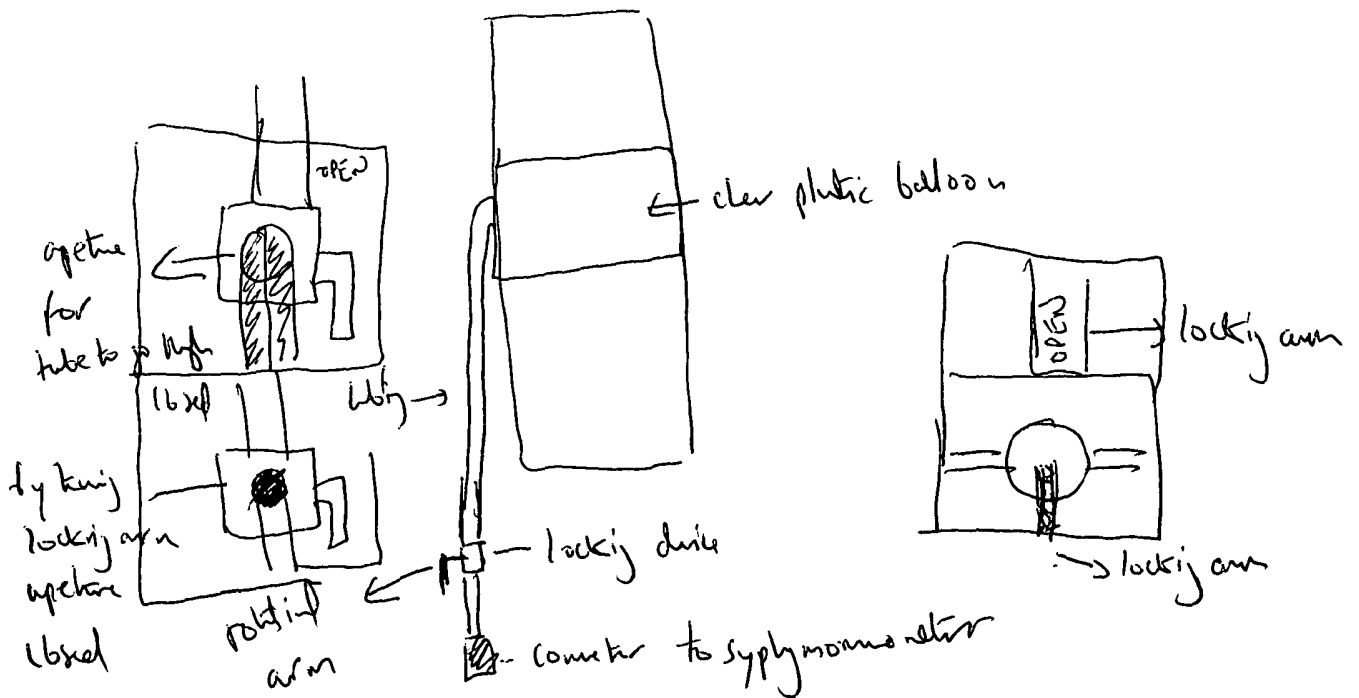


Figure 2



## **Patent Application**

1. **Title:** Radial angiography vascular closure device
  2. **Background:** This invention relates to the problems faced by devices used to close angiography puncture sites in the radial artery.  
 One of the major problems is making sure that there is adequate pressure to secure haemostasis without being too uncomfortable for the patient due to the high pressures involved.  
 Previous devices have not calibrated devices to increase the pressure over the wound that could be correlated to the patient's blood pressure thereby meaning that they could not ensure that pressure used is as minimal as possible to secure haemostasis.  
 Unfortunately over compression can occlude blood flow through the radial artery and this in combination with other factors can cause radial artery occlusion. This has been shown experimentally by Sanmarin in 2007 (*Catheter Cardiovasc Interv* 2007; **70**: 185–189). This has been found to occur in 9% of people undergoing radial angiography using ultrasound post procedure.  
 This is not normally a problem but if the patient in the future needs a repeat procedure, a dialysis fistula or their radial artery to be used as a graft in bypass surgery then this is a real problem resulting in poor patient outcome.  
 A study by Pancholy in 2008 (*Catheter Cardiovasc Interv*, 2008 Sep 1;72(3):335–40) showed that the rate of radial artery occlusion a statistically significant reduction of 75% in radial artery occlusion by using flow guided compression. This is a complex solution requiring significant staff input and training.
  3. **Statement of Invention:** To overcome this, We have devised a device which has an inflatable balloon that can be connected to a portable sphygmomanometer that can be used to inflate the device to a precise pressure and alter it as needed, The pressure can be decided upon by the staff checking the blood pressure on the other arm to decide the pressure needed to inflate the device to.  
 The portable sphygmomanometers are already commercially available and we will make are tubing standard to fit existing devices.
  4. An example of the invention will now be described by referring to the accompanying drawings.
- Figure 1: Shows a clear plastic band with Velcro strapping. This is to allow clear visualisation of the puncture site and a means to secure the device. There is a reinforced area with firm plastic containing a balloon. This balloon will be made of sturdy plastic, be clear and connected to a clear tube. This tube will connect to a standard sphygmomanometer. This allows precise inflation of the balloon to a specific pressure. There is also a simple locking device to maintain pressure.
- Figure 2: Shows a close up of the locking device and the connection of the balloon to the strap.

## CLAIMS

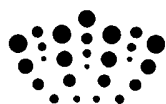
Claim 1: The radial angiography vascular closure device is a device to cause haemostasis following angiography. It consists of an inflatable balloon which is secured in a comfortable plastic strap with Velcro to secure it. It is inflated in a graded manner using a sphygmomanometer.

Claim 2: The radial angiography vascular closure device is a device which causes haemostasis by compression using an inflated balloon as in claim 1.

Claim 3: The radial angiography vascular closure device as in claim 1 aims to reduce radial artery occlusion by using precise inflation measurement to just above physiological pressure as measured by standard methods.

Claim 4: As in claim 1, the radial angiography vascular closure device can be deflated as necessary using the balloon and sphygmomanometer.

Claim 5 : The set up in claim1 will mean that the radial angiography vascular closure device should be more comfortable as it is inflated just above physiological pressure.



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**Examiner:** Dr Matthew Parker

**Claims searched:** 1-5

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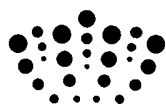
## Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-5	US2005/0187501 A1 (RAVIKUMAR), see Figure 1
X	1-5	US2004/0122469 A1 (AKERFELDT), see Figure 1
X	1-5	US2003/0199922 A1 (BUCKMAN), see Figure 1
X	1-5	US5514155 A (DANESHVAR), see Figure 4
X	1-5	US5234459 A (LEE), see Figure 4
X	1-5	CN200963167 Y (WU), see abstract
X	1-5	CN200991278 Y (ZHIGANG), see abstract
X	1-5	CN2633222 Y (ZHONGRAN), see abstract
X	1-5	WO2011/076640 A1 (ADENMARK)

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

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Worldwide search of patent documents classified in the following areas of the IPC

A61B
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The following online and other databases have been used in the preparation of this search report

EPODOC, WPI
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**International Classification:**

Subclass	Subgroup	Valid From
A61B	0017/135	01/01/2006