**Purpose:** To review the literature and report a case describing peripheral cutting balloon usage in airway stenosis management. Preliminary experience suggests that the cutting balloon is safe and effective, and has subtle pros and cons compared to standard balloon dilation.

**Design/Method:** Literature review/case report

**Summary:** The cutting balloon was initially introduced for coronary angiography. The balloon has 4 longitudinal blades, allowing it to score the lesion prior to dilation. It was designed to effectively dilate with less pressure than a conventional balloon. It has been reported to effectively treat pediatric tracheal, bronchial and subglottic stenosis effectively, although the literature is very scant. We describe a case in which the Boston Scientific™ Peripheral Cutting Balloon was used to safely and effectively dilate an adult’s airway from 1 mm to 5 mm diameter. A significant advantage of the cutting balloon compared to a conventional balloon is that the blades anchor the balloon into the tissue, preventing the balloon from sliding out of the stenosis during dilations, as commonly occurs with conventional balloons. Disadvantages include possible damage to the vocal cords if not used carefully, and possibly increased bleeding.

**Conclusions:** The cutting balloon can be used safely and effectively in the airway, and is a good option to add to ones armamentarium in the management of tracheal stenosis.

**Literature Review:**
- Primarily described in angioplasty. Has been shown to be equally effective in high-pressure balloons in short-term studies.
- Has been used in urethral and ureteral strictures.
- Has been described in pediatric tracheal, bronchial and subglottic stenosis, but literature is scant.
- Not yet described in adult airway.
- Overall, literature is scant, limited to case reports, but overall suggests that it is safe, and equally effective as the traditional balloon.

**Peripheral Cutting Balloon Dilation System:**
- Endovascular balloon
- 4 longitudinal blades
- Effective dilation with less pressure than conventional balloon
- In theory, should cause less mucosal trauma
- Designed for coronary angiography

**Case Report:**
- 24 year old male with history of laryngotracheal separation following MVA at age 17.
- Required tracheotomy for multiple years following accident despite multiple attempts at open airway reconstruction, including laryngotraceoplasty and tracheal resection.
- Nitinol stent placed in 2008 finally allowed successful decannulation, although the patient required frequent dilations.
- Decision made to attempt dilation with cutting balloon.
- Although dilation with the cutting balloon did not lead to successful decannulation, we did achieve effective dilation in a safe and controlled manner.
- The patients stenosis is currently being maintained with a Montgomery t-tube.

**Conclusions:**
- Given complicated nature of this particular patients airway, balloon dilation with the cutting balloon did not lead to successful decannulation as we had hoped.
- We were able to achieve dilation in a safe, controlled manner.
- Advantages over conventional balloon:
  - Blades anchor balloon into tissue so it doesn’t slide
  - More control
- Disadvantages to conventional balloon:
  - Theoretically more bleeding, although we did not observe this to be a problem
  - Potential damage to vocal cords if used in subglottis and not careful about positioning of blades.

**References:**

Bronchoscopic revealed this stenosis, which measured 1 mm in diameter, and was located approx 3 cm inferior to the level of the vocal cords.

Cutting balloon showed in position. A 8 mm cutting balloon was used, and inflated to 4 atm for 30 seconds.

Resulting airway is approximately 5-6 mm in diameter, a significant improvement.