

THE « *BUTTONHOLE* » TECHNIQUE

(SUMMARY OF EXPERIENCE IN MOROCCO)

* ***M.Rawa,*** marek@menara.ma
** ***H.Dkhissi,*** dkissi@menara.ma

* Polyclinique « Cornette de Saint Cyr »,
** CHM, Meknès, Morocco

What is the « Buttonhole » Technique ?

The “Buttonhole” (BH) is a method of puncturing AVF where the exact same point of puncture and alignment are used in consecutive dialysis sessions, rather than changing the point of entry (up and down the vein) on successive dialyses.

In patients with prior dialysis one can use this method to create new access points.

The « Buttonhole » Technique Was Described in 1977, in Poland by Z. Twardowski and H. Kubara.

SZEŚCIOLETNIE KLINICZNE DOŚWIADCZENIE
Z WYTWARZANIEM I UŻYTKOWANIEM WEWNĘTRZNYCH
PRZETOK TĘTNICZO-ŻYLNÝCH U CHORYCH LECZONYCH
POWTARZANYMI HEMODIALIZAMI

ZBYLUT TWARDOWSKI, ROMAN LEBEK, HELENA KUBARA

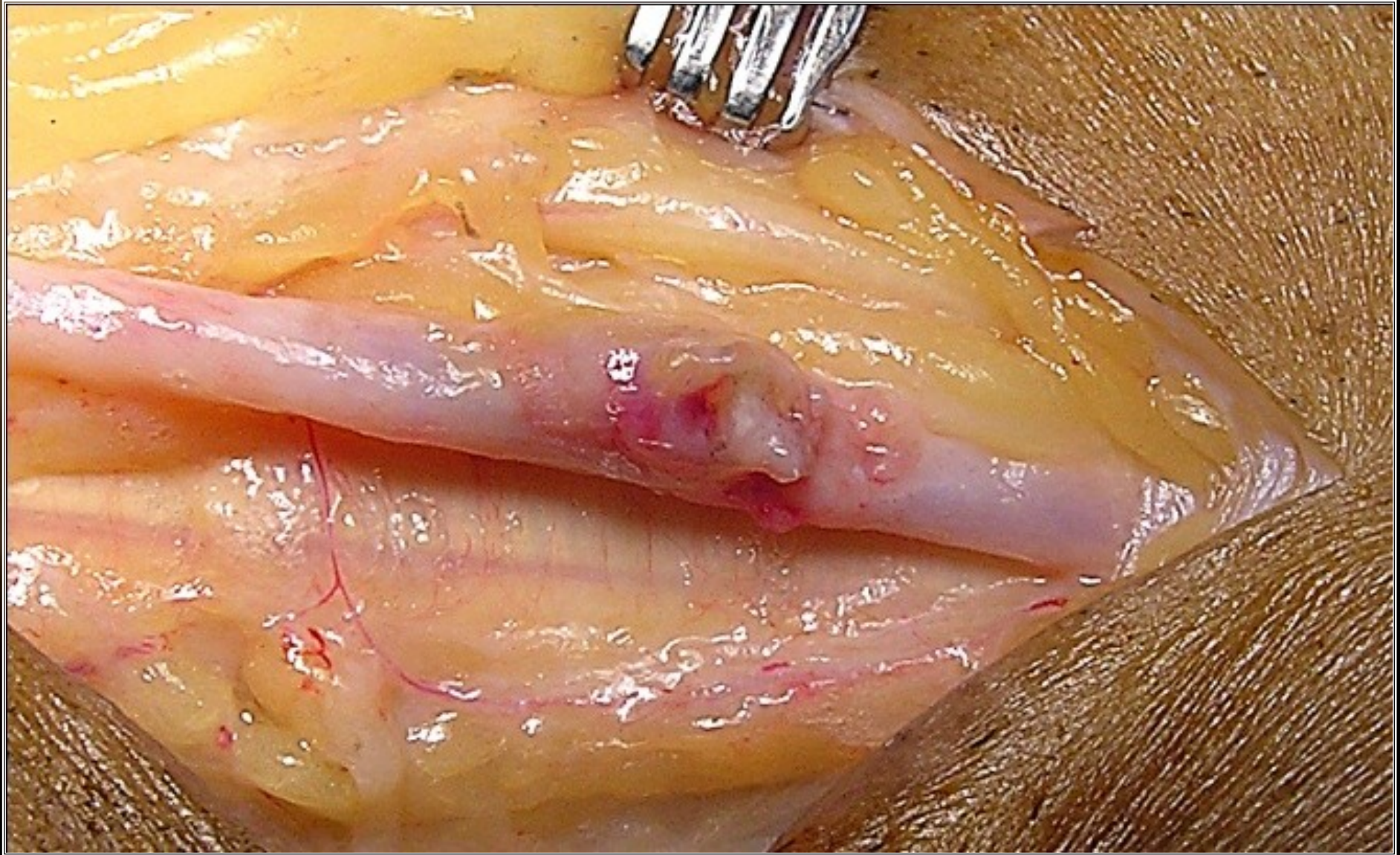
Z IV Oddziału Chorób Wewnętrznych Szpitala Górniczego w Bytomiu, ordynator:
dr hab. n. med. Z. Twardowski

The buttonhole technique is now widely known and used in many countries and, according to several authors, it will likely soon replace traditional (e.g. rope ladder and site rotation) techniques.

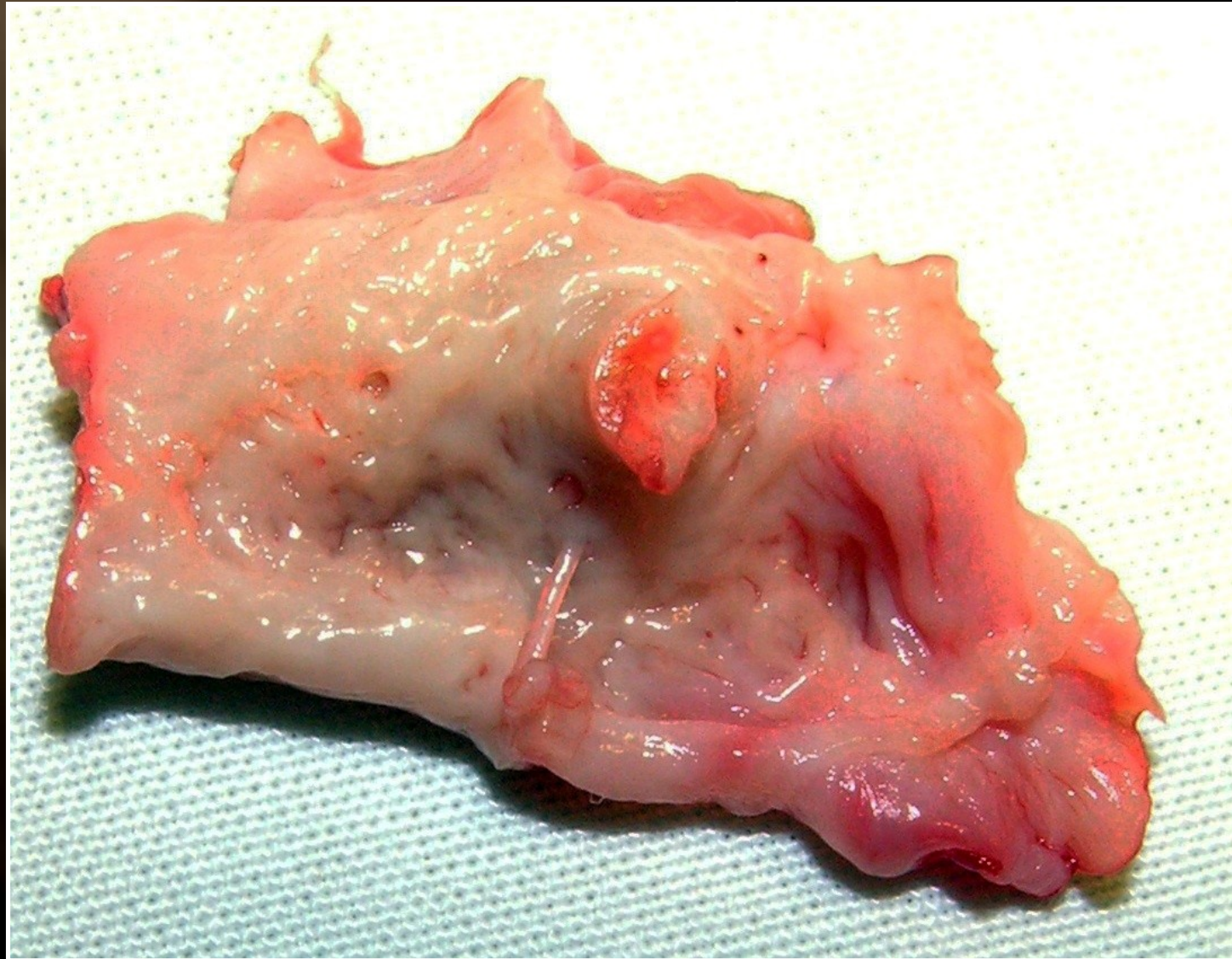
Commentary by Todd S. Ing, MD:

“Dr. Twardowski's unique invention, the innovative buttonhole technique, is receiving an increasing and very well-deserved international recognition. The method is suitable for both in-center dialysis and the home dialysis settings. One would not be surprised if this approach became the technique of choice for puncturing arterio-venous fistulas one day”.

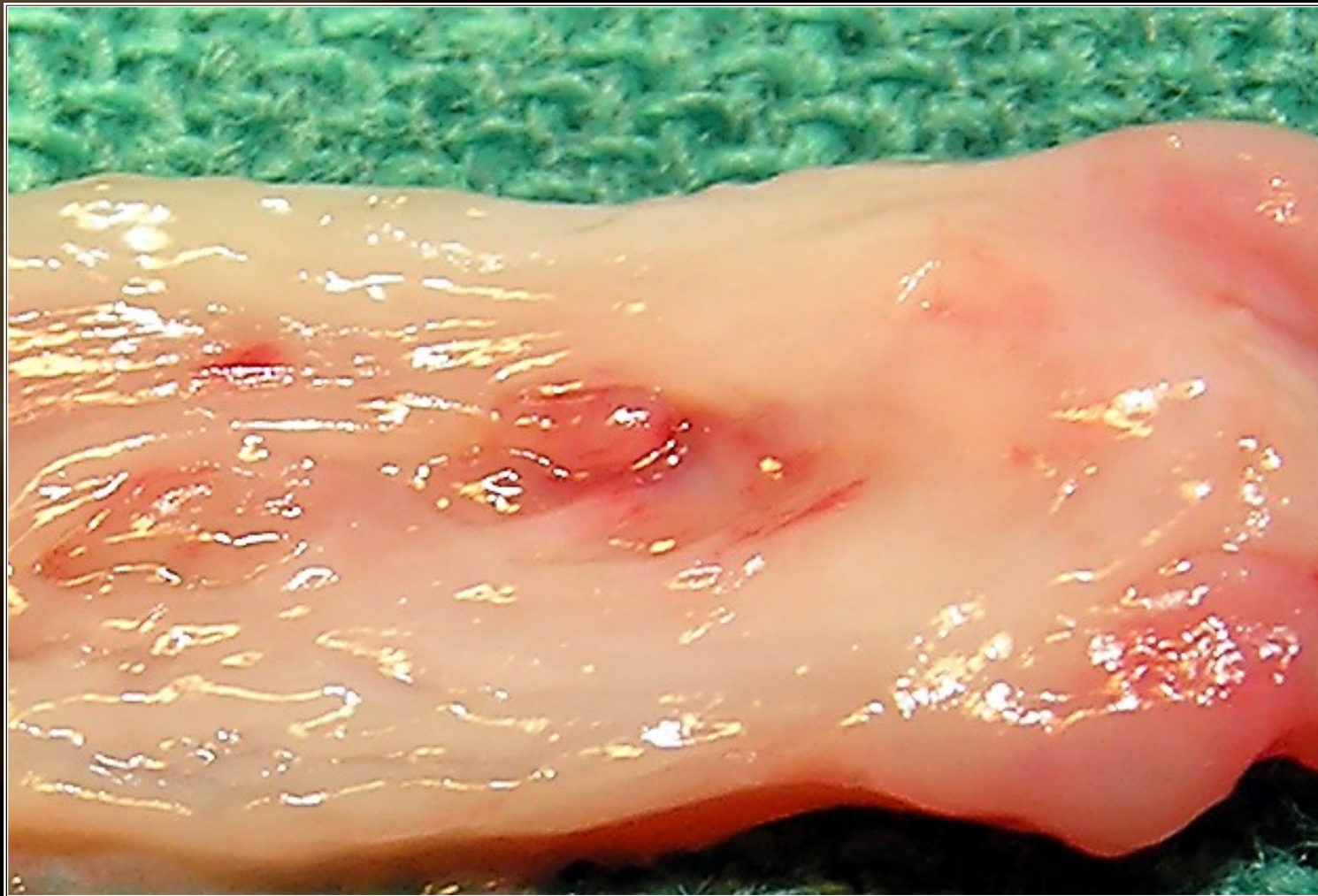
The Principle



The Interior of Vein Cannulated by Standard Technique



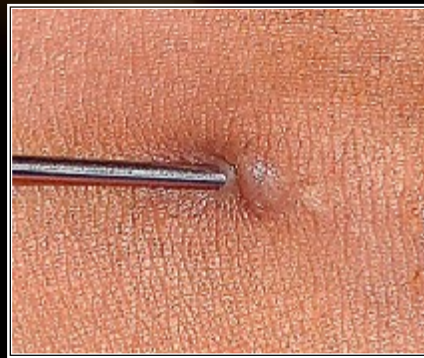
When cannulating in the same identical spot there is no weakening of the wall. This is the Buttonhole!



The are Numerous Myths Regarding the BH Technique

Some of the more common ones include:

1. *The BH technique is suitable only for patients who practice auto-dialysis, outside of dialysis centers.*



This is not true!

If a patient can introduce a needle on his/her own, then a qualified nurse in a dialysis center can also do this.

Myths:

2. The BH method may only be use on patients with new AVFs that have not been previously cannulated.

This is incorrect.

The BH method can begin being used at any stage on dialysis patients.

Tony Goovaerts said: "We have been using the BH cannulation technique since 1997 and are very satisfied with the outcomes.

We started with our home patients, then in our self-care units and finally in all our in-centre patients with an AV fistula!

The BH is probably the best cannulation technique

for all patients with an AV fistula! »

(Journal of Renal Care 2008)

Myths:

3. Cannulation in the same location can cause aneurysms.

Experience shows that traditional methods are the ones that cause aneurysms; while aneurysms are not observed in BH dialysis patients.



In 1984, Dr. Kronung compared the rope ladder, area puncture and buttonhole technique, and found that the area puncture technique caused the greatest aneurysm formation and the buttonhole technique showed no aneurysm formation.

(Kronung, 1984)

Aneurysms are Caused by Traditonal Cannulaton not by BH!



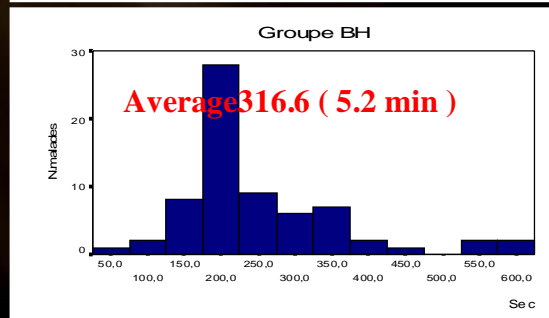
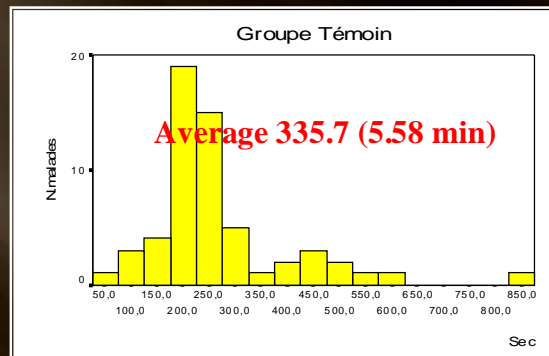
« Also, observational reporting from facilities across the United States and Canada indicates no aneurysm development using the BH technique has been noted to date.”
(Lynda Ball, 2005)

Myths:

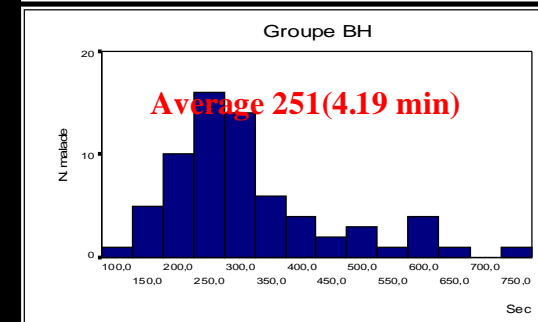
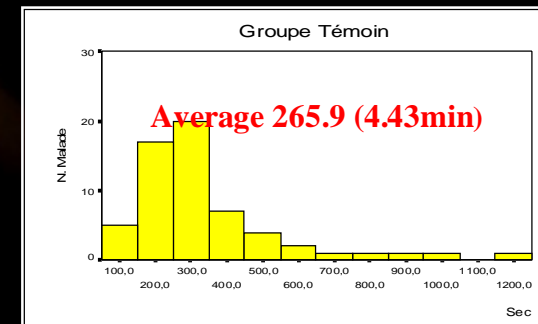
4. Hemostasis takes more time.

Comparative studies have shown that hemostasis takes the same amount of time or occurs faster with BH technique.

The time of arterial compression :



The time of venous compression :



Differences Between the BH Technique and Traditional Methods

1. Tunnel creation

The cannulation angle varies slightly in each patient depending of the thickness of subcutaneus tissue.

It is important that the cannulator creating the track notes the angle, or even photograph it and communicates this information to the staff.

Differences Between the BH Technique and Traditional Methods

2. The scab

Prior to each cannulation, the scab has to be removed in order to use the exact same access track.

The scab should be moistened (with an hydro-alcoholic solution, for example) and removed within a few minutes with a compress.

Differences between the BH technique and traditional methods

3. Connecting the patient

During track formation (2-3 weeks) it is recommended that the same cannulator be dedicated to cannulate the patient.

Once the track is formed, the patient may be cannulated by other personnel.

Limitations

The following are often cited as barriers to the BH technique:

- q **Obese patients with several centimeters of sub-cutaneous fat.**
- q **The patients with mobile veins.**
- q **Presence of scar tissue on the arterialized vein.**
- q **Staffing patterns within hemodialysis units.**

In reality these observations concern the classic techniques as well as BH.

Potential Complications

Complications associated with the BH are rare.

Amongst these are :

q **Oozing from the needle sites:**

Oozing occurs when the track diameter is larger than that of the needle or if the patient is heparanized. The needle needs to enter the track like a hand in glove.

The track can also be cut if the needle is introduced at a slightly different angle or if a sharp instead of a blunt needle is used.

q **The « trampoline » effect:**

This occurs only once the track has formed – and when one starts using a blunt needle: The needle enters easily but bounces off the venous wall. In such cases, the one should continue using sharp needles.

Benefits of BH for the Patient

- q Preservation of a high quality vein in case the vein is needed for a future surgical intervention.



- q Absence of peri venous hematomas and as a consequence an absence of peri venous fibrosis.

Benefits of BH for the Patient 2

- q **Absence of aneurysms**



- q **Faster and painless cannulation**
- q **Fewer missed sticks**
- q **Lengthened AVF life**
- q **Auto dialysis is much easier**

The buttonhole technique is just another method of inserting needles into an AV fistula.

It should not cause a decrease in blood flow rates, increase in alarms, increase in machine pressures or a change in dialysis results.

Our Experience

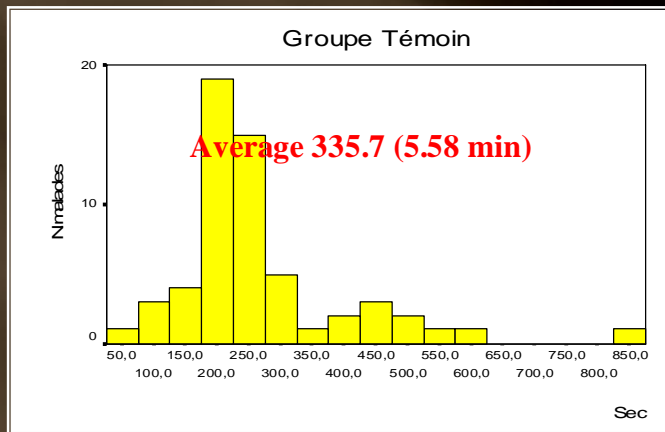
- q 1998: All our new patients are cannulated using BH technique.
- q November 2001:
- q 53 patients (new patients , or new AVF) are introduced for our study and compared with 68 patients canulated using traditional methods.
- q Two equivalent groups were compared on March 2005.

Evaluation

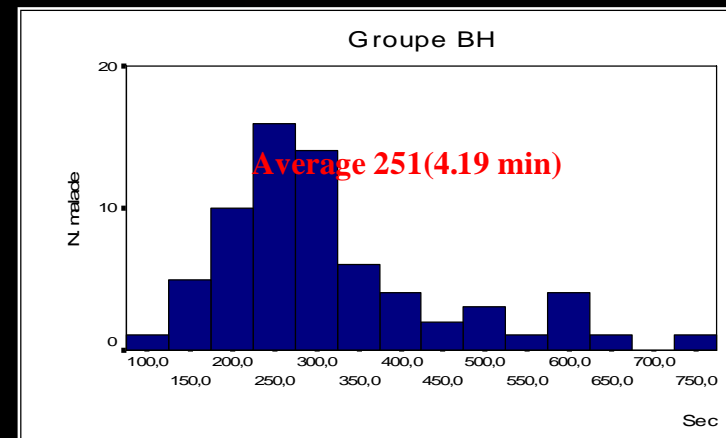
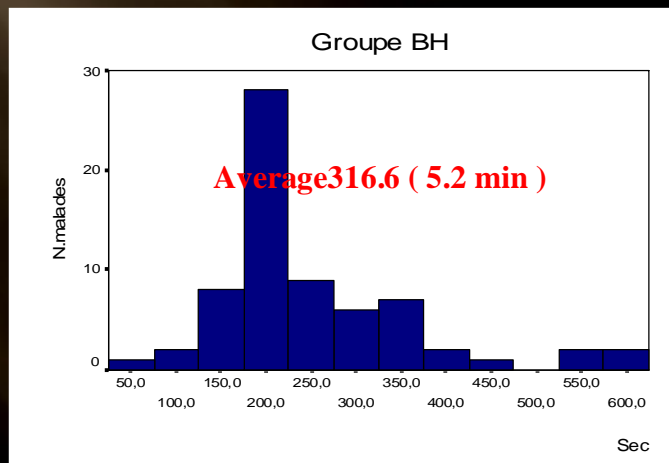
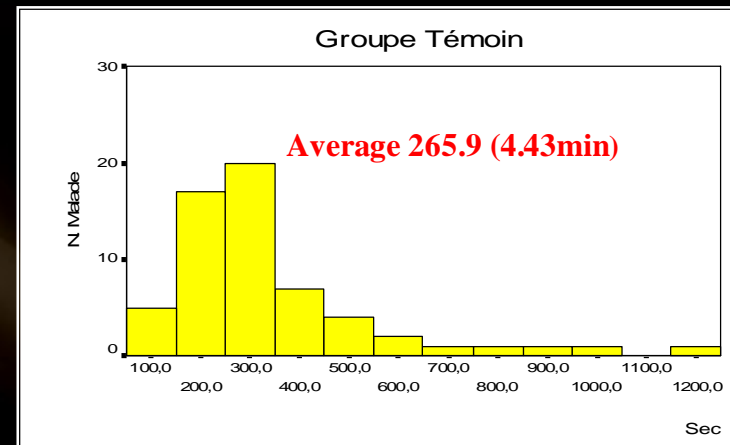
- Time of hemostasis after 6 consecutive dialysis sessions.
- The dialysis quality based on the K_Tv (Daugirdas second generation) and the URR.
- Infection rate of the dialysis spot; aneurysm formation.
- The patient's and the nurse's experience was systematically evaluated.

Evaluation: Time of hemostasis after 6 consecutive dialysis sessions.

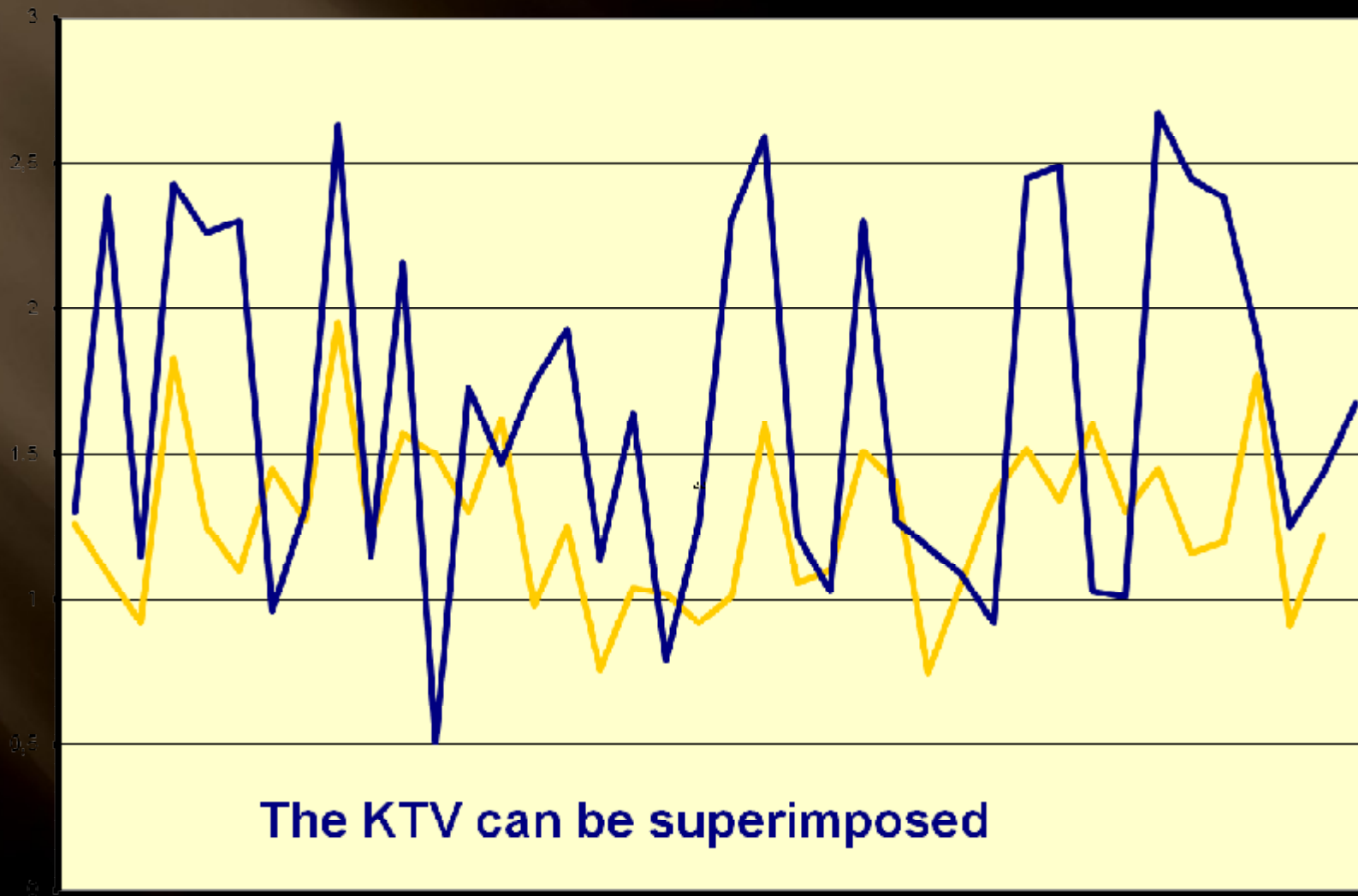
The time of arterial compression :



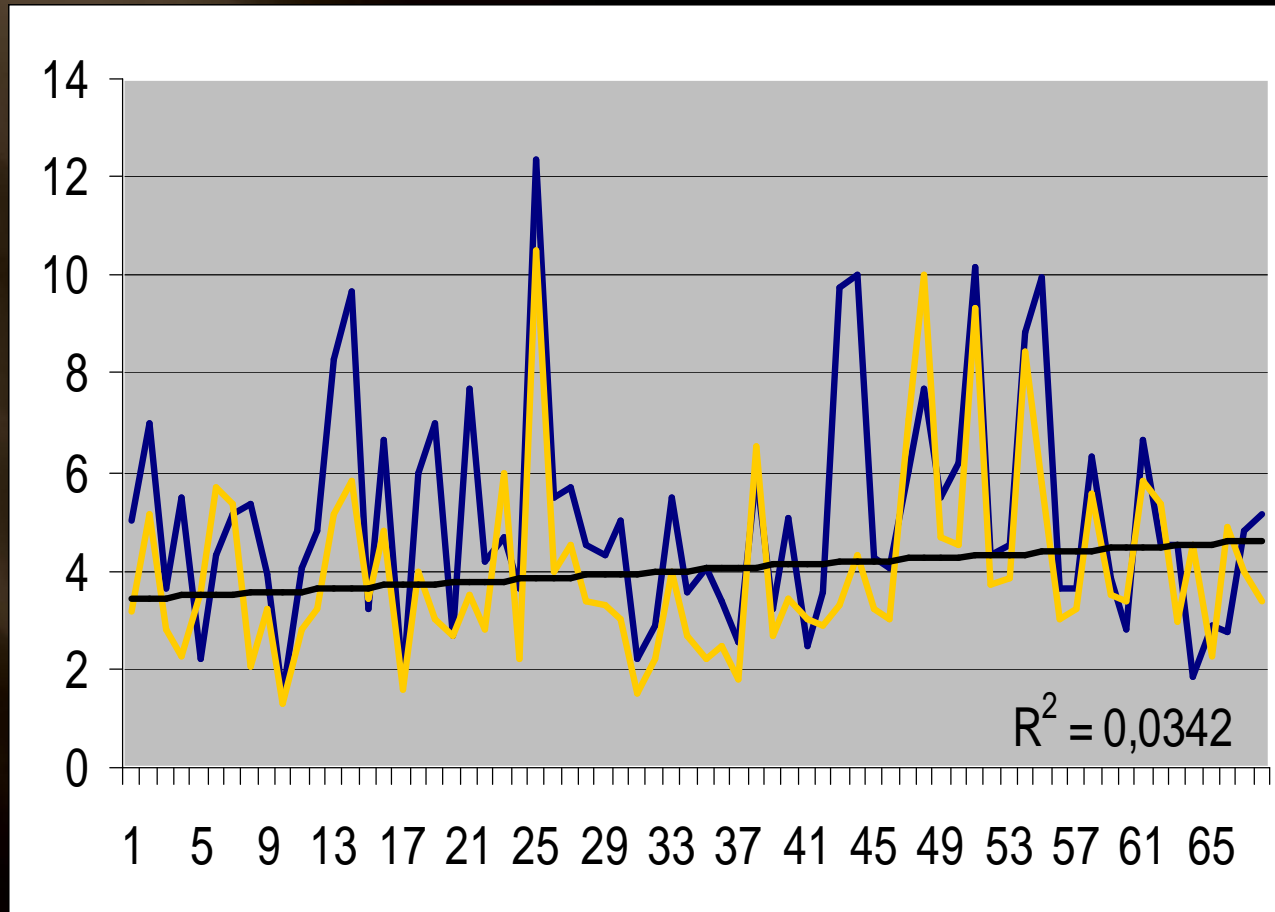
The time of venous compression :



Evaluation: The dialysis quality based on the K_Tv (Daugirdas second generation)



Evaluation: Urea Redution Rate (URR)



Observations:

- q The BH was very well accepted by our staff and by our patients.
- q The BH puncture points are changed only by a nephrologist.
- q Three cases of local infection for more than 100000 dialysis.
- q No aneurysm developed.

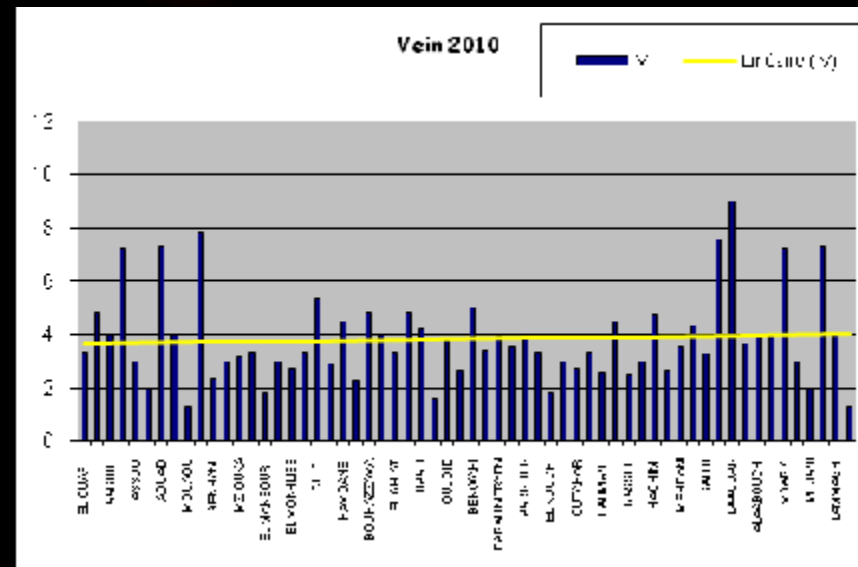
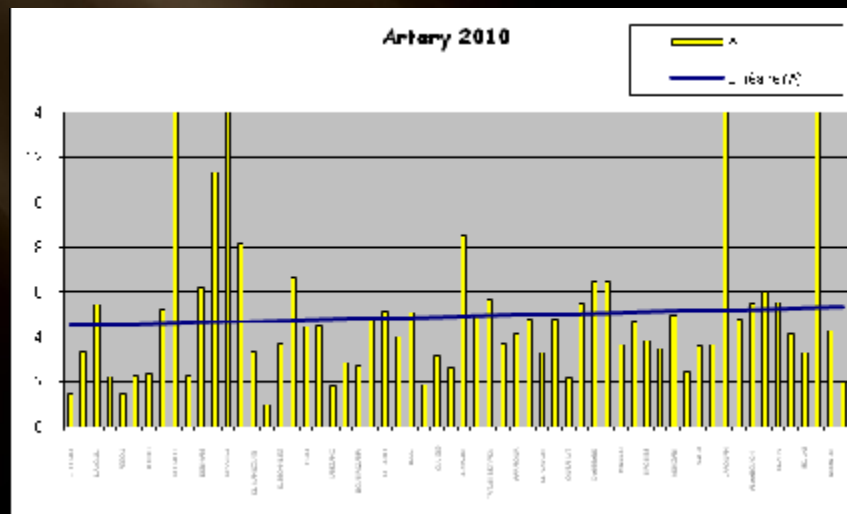
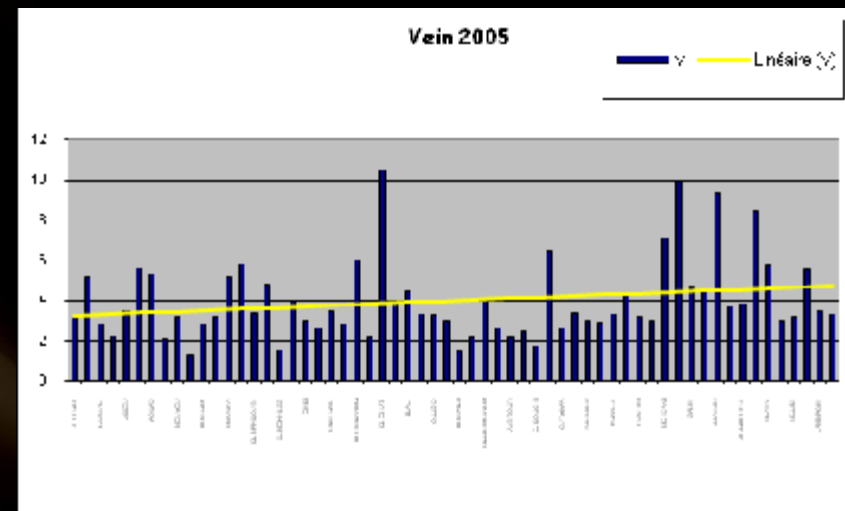
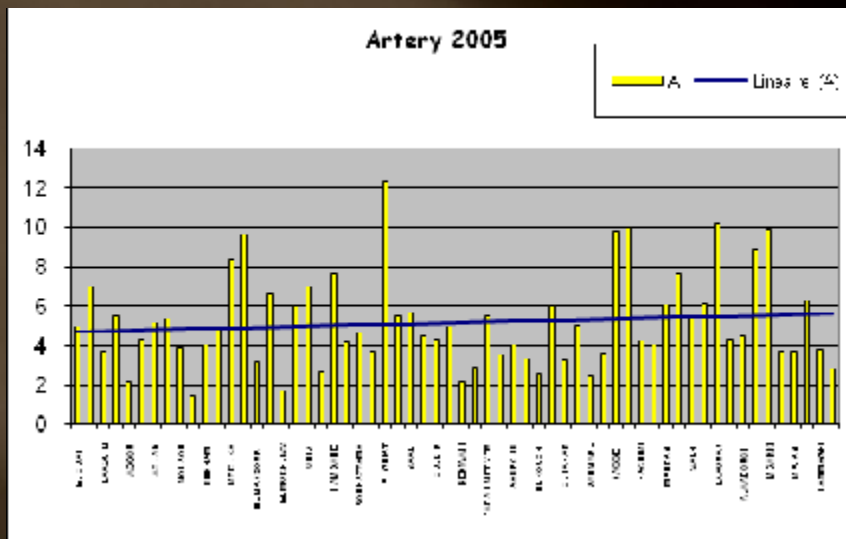
Five Years Later - 2010

We have 206 BH patients under dialysis.

The 57 BH patients under dialysis in our center during 10 years or more were reevaluated:

- q Time of arterial and venous hemostasis
- q Infection
- q Appearance of aneurysms

Time of hemostasis



Results - 2010

**Five cases of local infection for more than 200000
dialysis sessions.**

No aneurysm developed.

Discussion

- q We use sharp needles because the blunt needles and Teflon catheters are simply not available in Morocco.
- q But we are convinced that blunt needles are better (straighter tunnel track, less hematoma, smaller scabs, complete disappearance of oozing) especially when multiple nurses cannulate - and no aneurysms at all.

"To date, we have 119 patients on BH with only 44 left to convert.

All new patients with native AVFs are commenced on the technique.

We have discovered, through photographic audit, that once patients have been converted from area puncture to BH, aneurysms shrink and scarring fades.

The majority of patients experience less pain on cannulation and shorter bleeding times post dialysis".

Jackie Ross and Jacqui Annand, Journal of Renal Care 2008

Discussion 2

- The pain evaluation is difficult to quantify but our patients confirm that the BH causes less pain.
- The rule : « same AVF, same patient, same nurse » is for us the guarantee of the success.
- Strict hygiene of the puncture point.

Conclusion

The BH technique presents numerous advantages and merits being attempted in each hemodialysis center.

We are convinced that after a trial period the BH method will be preferred and adopted not only by the caretakers but also by the patients themselves.