

THE AFIB REPORT
Your Premier Information Resource for Lone Atrial Fibrillation
Publisher: Hans R. Larsen MSc ChE

VIRTUAL LAF CONFERENCE

Proceedings of 36th Session
January 17, 2005 -

SUBJECT: Right Side vs Left Side

I am sure most of us have found that position in bed can make quite a difference to ectopic frequency and risk of initiating a full-blown episode. In this new Conference Room topic PC outlines some of the reasons why this is so and what you can do about it. Please join in the discussion and share your experiences.

Hans

Right Side v. Left Side

There have been numerous posts on the BB indicating a connection between lying on ones left side (left lateral decubitus position) and triggering AF. I have also read separate reports elsewhere claiming this for either side. So which is it? And why?

A couple of years ago Hans turned me onto an article out of the Japanese medical literature (2002) entitled "Effects of Right Lateral Decubitus Position on Plasma Norepinephrine and Plasma ANP Levels in Patients with CHF". It states that "in the right lateral decubitus position, sympathetic tone decreased, whereas parasympathetic activity increased". But his was in CHF patients and not LAFers.

Then I happened upon another article (1997) entitled "The Effect Of The Lateral Decubitus Position On Vagal Tone". By using spectral heart rate variability analysis they found that "cardiac vagal activity is greatest when the right lateral decubitus position is adopted".

Both of these articles seem to go against the grain of the LAF experience, at least based on the posts in the BB. So in the wee hours of one recent morning I performed a little test. Around 3AM I was awake and became aware of increased PACs. I happened to be lying quietly on my right side at the time. I counted them silently and remained motionless. Slowly I switched sides and waited a few minutes to attain a sufficiently "quiet" state and began counting PACs again. Then I repeated the whole process again on the right side (guess I'd better consider increasing my Mg and Vit B6 (the dream vitamin) to achieve a deeper sleep state at 3AM).

Two interesting observations were made: 1) PACs occurred only when lying on my right side (right lateral decubitus position); 2) PACs occurred almost exclusively at end expiration. This latter observation appears to be related to respiratory sinus arrhythmia (RSA). End expiration is precisely the point in time that RSA would predict this, the time when vagal tone maxes during the respiratory cycle. You'll recall that RSA is an evolutionary adaptation of mammals to maximize gas exchange in the lungs. When the lungs are inflated, alveolar oxygen content is highest and pulmonary resistance to blood flow is least. So the HR picks up slightly to exploit this condition. Inspiration stimulates pulmonary stretch receptors resulting in withdrawal of vagal tone (and increase in HR). This stimulation is least (and vagal tone highest) at end expiration, hence greater likelihood of vagally induced PACs.

So how does lying on ones right side affect RSA? Well, the left lung is slightly smaller than the right lung, mostly because it has to share the left thorax with the heart. In fact the left lung only has two lobes v. three on the right. This translates to greater lung volume on the right than on the left. I think that when lying on ones side the more dependent (lower) lung is less inflated due to its more restricted position. So, when lying on ones right side there is less stimulation of total pulmonary stretch receptors (and greater vagal tone) than when lying on ones left side.

Having said all this, I for one have definitely triggered AF when lying on my left side. How does this then happen, since my LAF is predominantly vagally mediated atrial fibrillation (VMAF)? Well, the stomach lies in the left upper quadrant of the abdomen. It empties into the duodenum, which lies immediately to its right. So, gastric emptying is enhanced when one lies on ones right. Lying on ones left impedes this emptying and leads to gastric reflux, i.e., GERD. Vagal nerves (vagal afferents) from the stomach stimulated by reflux lead to neurons in the brain (nucleus ambiguus) which are in very close proximity to those that receive signals from the pulmonary stretch receptors and the carotid sinus. Although it has not been definitively shown thus far, I think there is crossover stimulation, i.e., reflux causes slowing of the HR.

Thus, in conclusion VMAFers and those with GERD should not recline while they sleep. That's a joke. IMHO they should sleep on their right side for the first couple of hours after eating (longer for larger meals) and then favor their left side for the rest of the night.

ALAFers should always sleep on their right side.

And, if you don't have AF but only a tummy ache, then lie on your right side.

Discordant opinions and/or reports of differing experiences are most welcome.

PC

PC,

This is incredibly interesting! I, myself, am mostly adrenergic but have noted that if I lie on my left side when I first go to bed, I will usually go into AF within 10 minutes. So, I have learned to lie on my right side when I first retire, then if and when I wake up about 3 or 4:00 am, I turn onto my left side without any problem ensuing.

Thanks for this information.

Marian

Totally happens to me when I lay 90 degrees to the mattress on my left side!

I also wear a metal brace around my upper body whenever I'm up and about and cant rest my head on something, in order to support my neck which has had three separate cervical fusions many years ago (mid-to-ate 1980s) and to compensate for my polio-weakened neck muscles so the brace helps support the ruptured discs above and below the fused block of vertebra from C-3 through C-6.

Anyway, this brace has a pad running just across my stomach and across my middle back with straps connecting the front and back pad across the lower rib cage, and has been the culprit in triggering AFIB when I lean too far forward against this. I guess it must compress the vagus nerve where it runs into the stomach.

At least that's my theory. Thanks for the interesting report!

Shannon

Hi PC and Hans,

A couple of questions for you in simple terms (i'm medically uneducated):

1. I was diagnosed with a "wandering stomach" when I had a Barium meal scan a few years back. They scan your stomach and roll you through 360 degrees and scan you again. In the majority of the population the stomach remains the same shape through 360 deg. as it is held in place by the other body organs but with me the stomach and esophagus changed shape and shifted location, hence the term "wandering stomach". This surely must have some sort of impact on the vagus nerve as I sleep from side to side. I wonder how many other afibbers have a "wandering stomach"? I used to get PAC's when I lie on either side.

2. I have been diagnosed with a loose LES so this definitely has implications as far as leakage of stomach acid into the esophagus and the subsequent damage and increasing electrical activity to the underlying vagus nerve. A loose LES is significantly increasing in the general population due to obesity, alcohol, bad diet etc. so how many afibbers know the condition of their LES?

3. Organs such as the stomach and esophagus have their own electrical systems. When you are asleep at night whether lying on either side or on your back are these two organs "squashed" against your heart? In other words are these two organs in such close proximity to the heart because of the sleeping position and resistance of the bed mattress that their electrical systems "leak" over into the heart and cause ectopics? More so on the left side? Specially if an esophagus is stimulated and very electrically active with stomach acid from reflux and in very close proximity to the heart.

I have often thought that the physiology of our body organs around the heart is also a player in the LAF saga. Are the stomach, esophagus and heart too close together and pressing on each other in afibbers?

Dean

Hi Dean,

I'm not familiar with a "wandering stomach" (only a wandering eye=strabismus). My wife sometimes accuses me of having another variant of this.

However, it seems to me that if your duodenum maintains its position relative to your "wandering stomach", body position would have the same overall impact on your GERD and/or LES problem. IMHO a loose lower esophageal sphincter (LES) is more your problem than the wandering stomach. The irritation of the lower esophagus caused by reflux results in a vagal sensory barrage of the brainstem (NA).

I guess my view on the connection between GERD/LES problems and the vagus are not shared by most who post on the BB. I do not think that there is pressure on the vagus nerve or that there is local leakage of electrical charges or any other local phenomenon that triggers AF. I think that GERD and LES incompetence are associated with AF because they both result in additional signals being sent to the brainstem. Without overwhelming you with neuroanatomy suffice it to say that these sensory signals stimulate not only vagal motor nerves to the lower esophagus but also vagal motor nerves to the SA node. They both arise from exactly the same place in the nucleus ambiguus (NA).

This same process is at work in those in whom swallowing can trigger AF. Vagal sensory nerves from the soft palate and pharynx not only stimulate vagal motor nerves that result in swallowing but also vagal motor nerves to the SA node.

The same process is at work when cold water hits the face and HR slows immediately. But that's just my opinion.

I think it is more than coincidence that GERD (and AF) is much more frequently encountered in the physically fit, especially those that run.

Never exercise within a couple of hours of eating.

PC

Well in some ways I was brought up 'proper'... lol..... never to exercise after a meal and to not eat late at night.

I have definitely been better since being able to lie on my back [learned post hip ops] slightly propped up by 3 pillows, starting with one supporting my ribcage and the other 2 overlapping for my head and neck.

I daren't lie on my left side as this was previously a trigger for me, but comfortably lie on my right for short spells. Lying on my right side feels 'correct' for my stomach too.

I do remember reading many years ago to not place young babies on their LHS, the reason given was that their relatively large liver could interfere with/press on, both their stomach and their heart.

As for the filling of lungs.... I find that my HB is happier when I breathe in before bending or make any physical effort such as climbing stairs.... whether that is physical in the sense of a full chest or whether it is to do with oxygenation I don't know!

Joyce

A few thoughts... My main trigger for atrial ectopics and ultimately afib, was always the action of swallowing. Actually this connection slowly developed over time but became extremely strong, which ultimately led me to discover my GERD. I found that running was definitely the worst thing I could do. I would watch my HR jump from 140 bpm to 230 on the heart rate monitor immediately after swallowing during a run. If I didn't swallow, I had no change in HR. The increased rate would last only about 5 - 10 seconds then drop immediately back to 140.

I have read with interest the association with ectopic frequency and position in bed. I can also add support to this from my own experience. I wondered if anyone else has noticed a similar response when reaching their arms high above their head, like you would do if you were trying to paint the ceiling of your house. I always noticed ectopics that would occur, especially when I reached high with my left arm and kept it there for a while.

Peter

PC - Excellent observations and explanations, as usual. Thanks. Even though I no longer have AF, I'd like to comment on my past experiences.

I was mostly vagal. Always had to sleep on right side only; left side was a sure trigger...at any time of day or night with or without empty stomach.

And, I could not lie flat down on my back, either. Always had to have head, shoulders somewhat elevated when on my back with two pillows. This made for very boring sleeping but I trained myself never to turnover to the left side or back. If I did, I would wake up and reposition. Amazing what the mind can do.

After ablation, I note that if I have PACs... or rather what they have now identified as Sinus Tachycardia... it is only when lying on my right side. That's quite a switch for me.

Potassium, PC. Remember my post stating that if you can feel your heart beating at night when lying in bed, you are deficient in potassium.... this came from one of those old pioneers in nutrition... Royal Lee...I think he was a chiropractor.... After hearing this info, I always took a couple of potassium tablets when I went to bed.

Oh - and 5 HTP is excellent for getting one to sleep and staying that way. (It boosts serotonin.) But if you think you are deficient in B6, then the form of P5P is more effective and won't be stimulatory as is B6 some times.

Again thanks for the illumination. I'm glad to see your brain is still active - even in paradise!

Best,
Jackie

Hi Peter,

Your observation about raising your arms above your head is interesting.

I know that Hans has triggered episodes in the morning while still in bed by stretching his arms over his head.

I personally think this is due to the fact that when the arms are in this position blood flow into them is slightly restricted. The angle of both brachial arteries becomes a little kinked. Consequently blood flow through the carotid arteries (and the carotid sinus) becomes a little more brisk. The baroreceptor response results in enhanced vagal tone. Again this is just my opinion.

Jackie,

Your comments on K are right on. LAF is not only about autonomic tone (parasympathetic or sympathetic) but also about low K. Taking some before retiring is very prudent. I take 300mg, which is no more than that found in an 8 inch banana. I'm working on a more in depth post on K from a different perspective than the usual.

PC

I'm not sure if my experience fits in with any of the theories mentioned but here it is...

I'm not a big fan of splitting AF into vagal and adrenergic but for the purposes of this discussion I would be definitely described as a vagal AFer. In the last 6 years I've learnt to sleep on my right side, laying on my left is an excellent way to get me into AF. (I'm not sure my right shoulder will ever forgive me - it often screams at me to turn over)

I'm a fan of verifying and repeating experiments so I've frequently confirmed that the left side will put me into AF (often within the first minute of turning over). I've got to the stage where I can throw myself into AF on my left but if I turn over to my right quick enough I'll often revert to NSR.

The major thing I'd like to contribute to this discussion though is that when I do lay on my left, as well as an increase in ectopics (unlike PCs experience), there's always an increase in heart rate. Regardless of whether one considers themselves to be vagal or adrenergic I think it's important to view the two systems together, maybe it's a change in the balance of the two that brings about ectopics/AF (rather than any absolute heart rate).

There are times when my heart rate is particularly slow (around the 30 bpm mark) and moving over to my left will raise the heart rate a bit and make me more comfortable (though I'm asking for trouble if I stay on my left for long) One trick if my heart is going very slow is to 'almost' lay on my left. A pillow down the right hand side of my back so I'm sort of 45 degrees on my left can get my rate up but not to such an extent that AF will happen.

Maybe, as Dean hints at, physical contact is the only thing at play here? Prodding or pushing the heart with another bit of your anatomy might be enough to make cells excitable / increase the likelihood of AF?

I recommend a double bed, 5 pillows and no partner (or one who doesn't take up a lot of room :)

Happy tossing and turning.

James D

Add me to the list. But I can only trigger it (lying on left side, or on back, or by stretching arms behind my head) if I'm in one of my 'inflammatory' phases. When everything's OK and I've not had an episode recently I can lie any which way.

And if I burp while lying on my left side - it's a near certainty. I never used to trigger in bed - now it seems to be the only place it happens!

David

Well, add me to your list.

I have to lie on my right side or on my back. I put a pillow behind my back to keep myself from rolling over in my sleep. If I turn over on the left I go into afib within a minute or two. Sometimes I increase the slant of the bed (raised six inches) by adding pillows.

The anxiety attached to just trying to get some sleep for afibbers each and every night is something else.

Hans, since your ablation, can you now sleep in any position?

Carol

Hi Carol,

Thanks for posting.

I know you struggle with stress triggered episodes. I'm beginning to think that whether you prefer the right v. the left side for sleeping may be the litmus test for whether you are predominantly adrenergic or vagal respectively.

PC

Carol,

I don't notice any PACs anymore if I am resting on my left side, but I only do it very rarely as I have now gotten totally used to sleeping on my right side (a 15 year habit is hard to break :-).

Hans

Well, add me to your list also.

I have to lie on my right side also or my back. I also put a pillow behind my back to keep myself from rolling over in my sleep (sometimes). If I turn over on the left I get ectopics within a minute or two, that is a sure sign that if I don't move I will go into afib. Sometimes I increase the angle of the bed adding pillows as well, or sit up for a while reading etc, slowly lie down to sleep. I am predominantly vagal. Like Hans I have now gotten used to sleeping on my right side
. most of the time!

Take care,

David S vlaf 67yy.
