Batoning and Hidden Tang Knives

By Reid Hyken aka: Sharpshooter

Many times a question is asked about the relative strength of hidden tang knives when compared to full tang knives. Bark River makes knives in both styles and in many cases with the same blade shape and size allowing for comparison between the two designs.

First let's talk about the why of hidden tang vs. full tang. While a full tang seems to me to be the obvious choice because it just seems to be a stronger design, after all, steel is stronger than micarta, wood or any of the other handle materials. I also like the look of the tang sandwiched between the scale material. In the case of some woods, better scale blanks are available, in the area of figure and character, than the larger block needed for a hidden tang.

On the other hand, there are the folks who prefer the hidden tang. Their reasons are varied but usually it boils down to one of two points; first the exposed steel of a full tang would be very cold in hand were the knife to be used in arctic conditions, if your hand were the least bit wet it would be akin to licking a fencepost in the winter. These users generally prefer natural material handles, like used on the traditional "Mora" or "Scandi" as they tend to be "warmer to the touch". Another group is concerned that the exposed steel will corrode due to the "acids" in their skin or that blood and moisture will seep between the scales and tang.

Nobody is "Right" or "Wrong" in this issue; it's more a matter of personal preference.

The main point of this article pertains to the question of relative strength of the two designs and I can think of no better environment in which to test than in the Bushcraft field, most specifically "Batoning".

Batoning is a method of precisely cutting a large branch by driving the cutting edge of your knife into the branch using what is for all practical purposes a club. I guess you could call it bludgeoning or clubbing, but batoning has a friendlier ring to it.

What most of us think of as “Batoning” is when the edge is set on the workpiece and the spine receives blows from the baton, driving the edge into the work splitting it into thinner pieces.

I have also demonstrated and spoken of “Point First” batoning, which entails driving the knife point first into the branch and is used for splitting wood to reach the dry inner fuel or making two dimensionally smaller pieces for building shelter etc. Believe it or not, I have point first batoned a hidden tang Bark River Fieldsman II, in fact two of them into a frozen Osage Orange log in order to test the strength of the epoxy Mike uses to affix the handle to the blade. These knives were left in dry ice for several hours before the test, just to make things a bit more interesting. Much to my surprise both the Micarta and G10 survived without a hint of failure from the pounding.

Both methods are considered a proper technique, ironically regular batoning, with the edge first, is the only way I have experienced a knife breaking while batoning. Point first which seems to have more possibility of being abusive has never resulted in me breaking a knife. Also when a break does occur it’s not on the first couple of blows but rather after having done it for a while. The make or quality of the knife doesn’t seem to matter as I have broken some very good knives doing this. These failures seem to occur without warning or reason.

I stored this mystery in my data banks and didn’t really see much of a need to reexamine it since it didn’t seem to occur very often. Over time I noticed that it’s not as rare as one would think; in fact I saw and read about some very good knives breaking. I noticed a post on an internet forum; the writer was verbally trashing a #3 Eriksson Mora that broke when he was batoning it thru what looked like a 5” diameter poplar. A short time later I read about a Cold Steel Master Hunter breaking while batoning, again the allegations of “Bad Heat Treat” and defective knife began to fly. Looking at the pictures of these failed blades I was surprised to see the same break as I had experienced! There is definitely a pattern, now I just need to figure out what it is.

Seeking answers, I looked a lot at broken knives and asked a lot of questions, looking for a pattern as to what caused the failure. Mike was very receptive to my questions and we discussed this issue several times, never quite coming to a definitive conclusion.

A several weekends later the “Chicago BRKCA Gang” was out in the woods for an afternoon hike and lunch in the best spot in town. It’s been a while since I had worked with anything other than a NorthStar, so I slipped my Hidden Tang Rogue into my overloaded pack figuring that I would use the Bowie like it would have been used in the day when it represented the state of the art “Tactical Knife”. While we often think of Bowies as “Fighters” they were used everyday for whatever task came to hand, be it skinning out a buffalo or deer, whittling a stake for a tarp, slicing a piece of jerky or batoning a branch to build a shelter.

I took a freshly cut baton and set to work on a two-inch birch branch. The first two cuts were effortless resulting in cleanly cut pieces waiting for notching to make the twitch up trap I was building. As I worked at my task, I carried on a conversation with another Woodsbum, not really concentrating on batoning, suddenly, there I was holding the coffin handle in my hand with the blade of my Rogue stuck firmly in the branch.

What happened? The test was going so well and now I have a broken knife. Examining the break I noticed the same familiar appearance. The guard remained on the blade with a piece of tang protruding from the Micarta handle. The broken piece was angled down, the top broken shorter than the bottom, exactly the same as the Fieldsman II from last winter.

I sadly put the broken pieces back into the sheath and started loading up for the walk out, but I couldn’t help wondering why this happened.

It wasn’t until later that night that it hit me, clear as day. Re-examining the broken pieces and reviewing the event I discovered the cause.

The correct technique for batoning involves holding the knife level and striking the back of the blade squarely with the baton. This causes the force of the blow to be transmitted straight down against the work, driving the edge thru the wood. All of the stress from the baton is on the blade, the handle simply floating in my hand steadying the work.

When I resumed batoning after breaking a partially rotted baton, I was talking with Dan and allowed my technique to become sloppy. I remember my knuckles resting on the log I was using as a work surface just before I struck the last blow. Hmmmmm, maybe there’s a hint.

When I tilted the handle down I had created a lever, using the branch I was cutting as a fulcrum. The blow on the blade drove it down but the now down tilted handle would be receiving a lot of the energy. Holding on to the handle with the blade epoxied firmly to it with a minimal hold between the guard and Micarta allowed the tang to receive the energy bending it sharply up hence "SNAP" goes the tang because it is now being stressed in a direction and with a load it was never intended to face.

Thinking further back to another such failure, I was setting up the same stress with a slightly different method. I was splitting the branch; with the blade driven all the way thru the branch I was holding the handle and batoning the protruding point. Same geometry, same levering action and the same break. The Eriksson Mora was the same thing, blade thru the work, handle in hand and baton striking down on the point.

Revisiting some of the other broken knife stories, the pictures suggest that the writers had to be doing the same thing. In most every case this was, evidenced by the fact that the blade was buried thru a thick branch leaving either the handle or point to strike.

I think what we have is a failure due to poor technique rather than a manufacturing defect or design flaw.

I can hear a few of you saying; "Nice theory Sharpshooter, can you prove it?"

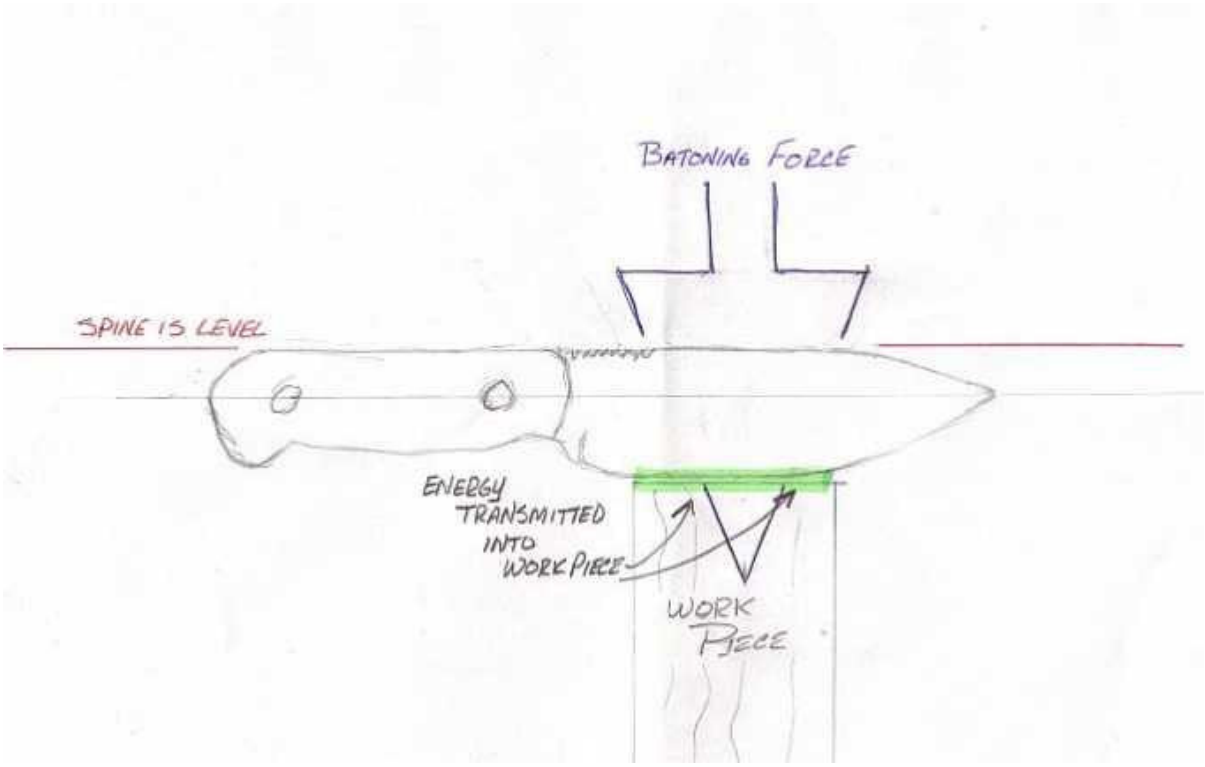
I'm not into breaking knives, good tools deserve better fates; but I have ordered a pair of basic red handle Moras. The design is a bit different, with a wooden handle and long stick tang but the test should still be valid.

Proving the Theory…

I believe that knives break because the act of batoning puts abnormal strain on the tang of the knife. If you use the correct technique almost any knife can be used to baton, including folding knives although I strongly recommend against doing so.

Then again, Batoning with a slip joint may be a good example of why the correct technique works when done right and can break the knife if not.

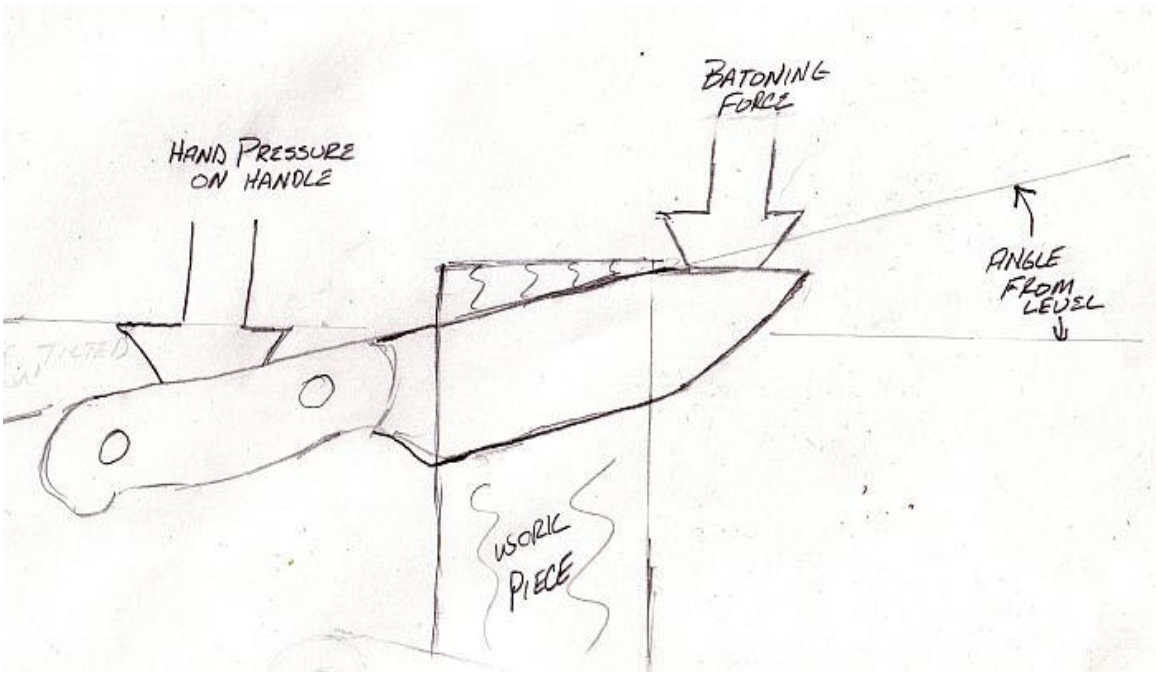
First let's look at how Batoning works, this picture pretty much tells the tale:



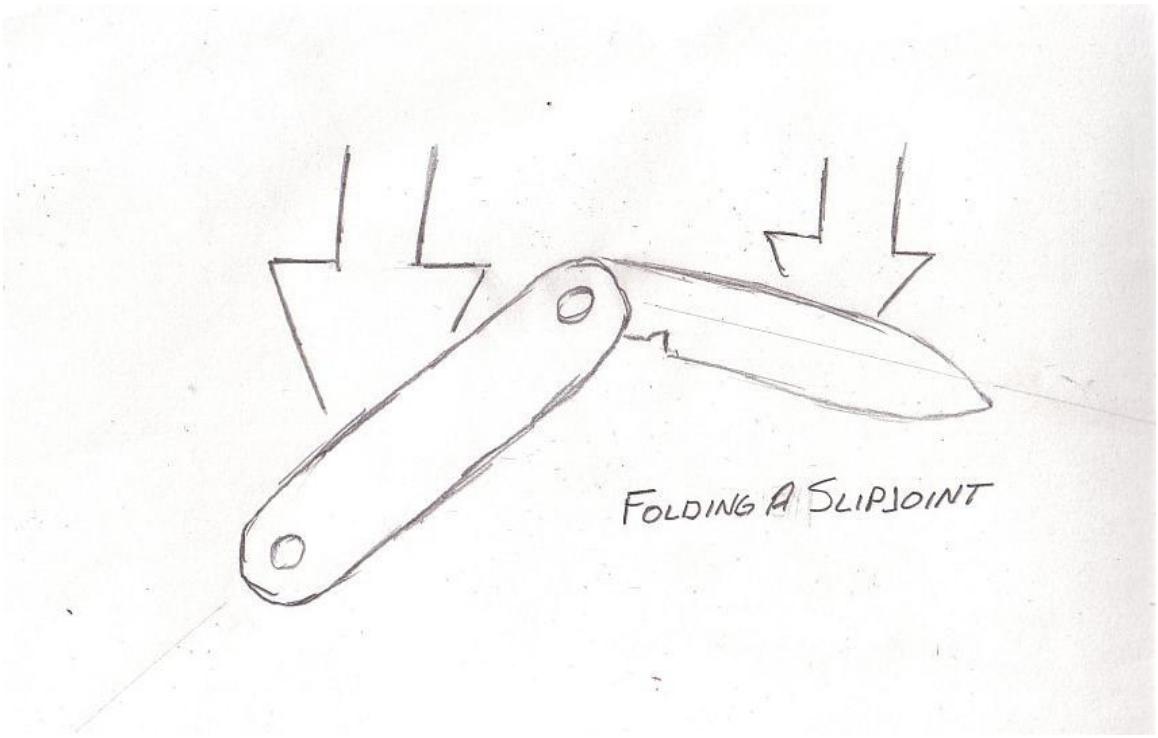
The force of the blows on the spine of the knife drives it directly down into the work piece. It's almost impossible to break a knife like this. The

problem comes up when the blade has been driven flush with the work piece making it impossible to hit the spine.

It seems correct to hold down on the handle while hitting as you can "help" the knife in splitting its way thru the work. This is correct so long as the handle is either level with or slightly above the line of the spine. Tilt the handle down and you are putting downward force on both the handle and blade with the work piece as the fulcrum.

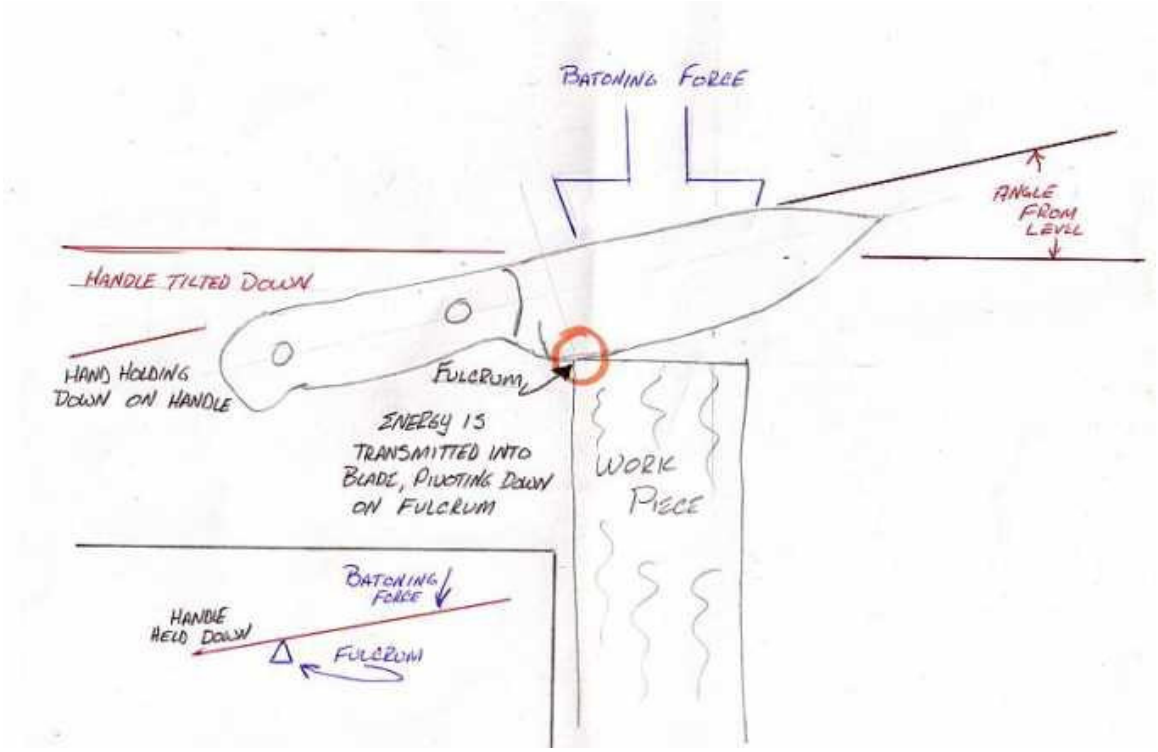


Actually the application of pressure is the same when you close a slip joint…



The difference is that the slip joint is already broken in the middle.

The problem will come up if you start batoning incorrectly, holding the handle below level.



Testing this theory wasn't difficult; I bought two inexpensive KJ Eriksson #2 1/2 Carbon steel Mora knives. Looking at the way Eriksson builds the knives told me that the knife would fail in a somewhat different way than what I've experienced with the Rogue.

Eriksson bores a large hole thru the handle for the blade tang to run thru with a bushing/lock at the end to wedge in locking the blade in. Since the blade essentially floats in the handle, the down force on the handle is transmitted to the back of the tang; most of the tang is unsupported. At the front of the handle, at the tang is a stamped "cover" or ferrule made of thin sheet metal.

I brought the knives along on one of our day trips into the woods for the testing. First I started batoning using the correct technique being very careful to maintain the handle relationship to the spine. As expected, the Mora performed extremely well. Many Bushcraft experts including Mors Kochanski tout the Mora as a fine Bushcraft knife and in reality our beloved NorthStar has direct roots to the inexpensive Moras. Splitting branches along the grain and batoning across the grain were handled with no problem or damage to the knife other than the edge rolling that I have come to expect from Scandi grinds.

I then took the second Mora and proceeded to make a few of the same sort of cuts but this time I made a conscious effort to keep the handle tilted below the point of the knife as I batoned. Splitting along the grain was no problem as expected as all the blade is really doing is pulling apart the long narrow cells or grain tearing the pectin hydrogels that glue them together.

Cross grain batoning is quite a different challenge for the blade. As the name describes, this cut is done across the grain, cutting thru the stronger cells making up the grain, often filled with hardened resins or tyloses. Holding the handle lower than the spine, simulating the exact technique I was misusing when I broke the Rogue, I batoned the blade into a 3" diameter red oak branch. I periodically stopped to inspect the knife. After about five sharp blows I noticed that the blade was actually slicing into the stamped ferrule; indicating that the blade was moving in relation to the handle, as expected. I reevaluated the first (correct technique) knife and saw no such damage.

Several more blows and the edge of the tang had cut through the side of the ferrule. At this point I recognized what was happening. Due to the

construction of the Mora, the unsupported tang was bending rather than breaking, we don't have the same shear on the front of the tang. Recognizing the bending as impending failure and realizing that the only thing between my palm and a potentially sharp broken tang and a nasty cut was a thin layer of wood; I decided to stop there.

Upon my return home, I split the handles apart and found a significant bend in the tang in the wrong technique blade while the correctly used knife was unaffected.

The theory is correct. My suggestion to anyone interested in delving further into this subject is for them to invest about $15 and buy a couple of Moras. After the test, you'll have a solid knowledge in batoning technique and a couple of nice blades you can use to build utility knives.

Correct technique while batoning makes it a safe and practical way of splitting wood; get sloppy and it's a very effective way of breaking knives.