It's Yellow, It's Green, It's Jaundice!

By Jack Adams, CFSP

Jaundice discoloration has long been a concern for viewing remains and always will be. There are many procedures and techniques that have been used and written about for treating jaundice. Almost all chemical companies have their own version of a jaundice fluid that will work well for these discolorations some of the time. There are different degrees of difficulty in color and tissue conditions that dictate different treatments. Sharing experiences at seminars is a good way to get a consensus that no one fluid or recipe and treatment will work for every jaundice case. This is also true with treating edema, emaciation, and various other difficult conditions. Because of various drugs used, the condition and color of tissue, the facts involving the death and time elapsed before embalming, it is nearly impossible to successfully use one chemical mixture for all jaundice cases.

The problem with many jaundice cases is their organ systems break down, causing such conditions as edema, ascites, and renal failure that cause increases of nitrogenous waste. Ammonia is one of the byproducts of the process and we are all aware that ammonia, or ammonia-based products should be included in our kits for reducing formaldehyde odors. Spongy tissue high in nitrogenous waste will need a strong solution to preserve it. A case of this kind may also have edema and skin separations where medical procedures have been done.

In years past, fluids with low concentration of formaldehyde, or with no formaldehyde, were recommended by many manufacturers for jaundice cases. All companies had their version of low or no formaldehyde fluids because the consensus was that formaldehyde would turn tissue green or greener, so avoiding a strong chemical was recommended. As time went on and people started living longer, the condition of the remains kept getting worse. Increases in edema, jaundice, and spongy tissue have occurred and difficult cases are now common and what used to be called "normal" cases are disappearing.

One chemical that was used often for treating jaundice was glutaraldehyde. However, used alone it didn't preserve. These difficult cases first need to be embalmed well or there won't be a chance for viewing. At this time in our profession, using chemicals that treat color but don't preserve tissue can be very costly. Embalming failures can cause

litigation because of mental anguish. A certain amount of preservation is a must. We must first treat the tissue condition and then improve the color. Bodies that have been treated with drugs can often have spongy tissue that is difficult to preserve. Organ systems break down and tissues become jaundiced and edematous. All these conditions make embalming and preservation difficult. Medical technology has made traditional jaundice chemicals less effective because the jaundice is often accompanied with edema and nitrogenous waste that demands stronger solutions to treat the remains for trouble-free viewing.

Let's take a look at the whole picture. Today there are more cremations and fewer viewings. Doesn't it seem like families are more apt to choose embalming when the body of the deceased is one of the more difficult to treat? Families are demanding to see value for the out-of-pocket expense for funeral procedures. They expect their loved ones to resemble themselves or at least be recognizable. This is not always the easiest thing to achieve when these cases have deteriorated due to organ and tissue breakdowns that are all effects of the disease that has caused the death. More and more cases that are brought to us within a few hours of death show signs such as greening of the abdomen which we would normally see many hours or days after a death occurred. People living longer with compromised immune systems begin to show these signs of deterioration of tissue even before death has occurred.

Tissue gas (Clostridium perfringens) is present within most living individuals. It is regularly found in the large intestine. A weak or nonexistent immune system won't do much to keep this active bug from spreading and causing embalming problems and sometimes failures. This is why it's important for us to first treat the tissue condition and not the color of tissue. We can always cosmetize a green body, but we can't cosmetize away decomposition. We can do both, thoroughly embalm the body and treat the color of the tissue.

The traditional jaundice chemical may work fine for some jaundice discolorations but not on remains that call for added preservative measures just to be possible to view. To be successful with today's jaundice case, we need to use a solution strong enough to preserve the tissue.

It's not enough to just mix a stronger solution in the embalming machine. I believe that it's not just what you inject but how you deliver it. The head, of course, is the most important part of the viewing and we should treat it with care. If we use the right carotid artery for most of our normal injections, we will notice that the left side of the head is sometimes embalmed adequately after injecting a half gallon of solution or less. We may notice that our drainage is more fluid or chemical than blood. All this tells us is that we're doing a short circuit injection with the chemical going to the point of least resistance from the arch of the aorta. The hands and legs may be discolored, but the head is embalmed.

Most of the embalming machines today hold three gallons of solution. Some embalmers will continue to inject downward even though the left side of the head is done. They may even inject the entire tank and mix an additional solution because the fingers or legs are still showing signs of discoloration or inadequate distribution. By now, the left side of the head is over-embalmed and perhaps even swollen.

By right, the left carotid should have been raised after the left side was done. It could have been clamped off and the flow to the head restricted. If this technique is used, one can open the left carotid artery above the clamp and allow excess fluid to drain out to avoid swelling of the already embalmed head. Sometimes there is a backflow through the vertebral artery, the opening of the carotid above the clamp will control over-embalming. Better yet, both carotids could have been raised initially to control the head injection and insure against over-embalming or swelling. I like to utilize both carotid arteries for all difficult cases including jaundice. A typical arterial injection to the head can consist of 18 to 32 ounces of chemical to each side. The strength of the chemical and amount of dye should always depend on the condition and color of the tissue.

Tissue that is edematous or very spongy will need a much stronger solution for preservation. The habit of mixing and using one solution for all cases because it's always been done that way by our predecessors can be a dangerous practice in this time of increasingly difficult cases. It's not uncommon for a body to have two or three different tissue conditions. One side of a head may be very swollen while the other side appears to be sunken and emaciated. Of course, this is due to the way the body was positioned before and after death.

Jaundice cases should be analyzed the same as any case, and that is to consider the condition of the tissue in addition to the color. The solution should always be geared to effectively embalm the body and the color should be treated within that adequate solution. I like to divide jaundice into two categories, normal or jaundice with edema because the treatments will be different. A preinjection can be useful for the normal jaundice case, but it wouldn't be recommended to preinject an edematous case because of further water logging the already edematous tissue.

The normal jaundice case would be one where the color of the skin is jaundiced, but the tissue seems to have close to a normal fluid content and there are no signs of decomposition or deterioration.

Normal Jaundice: Mix three bottles of Metaflow, three bottles of Rectifiant, and dye. No preservative will be added to this preinjection and the amount of the dye added will depend on the severity of the jaundice. Pancreatic cancer cases can be severe and already green before embalming. This severe green

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jaundice won't be washed or flushed away. It must be dominated with a more powerful red tone. A full bottle of dye may be needed to dominate the green, depending on what dye you're using and if it is concentrated or not. Icterine Regular is concentrated and on an extreme case you may need to add four to eight ounces or so for this solution to dominate the green. If you use a non-concentrated dye like Inr-Tone Blond, you'll most likely need 8 to 16 ounces for this preinjection. The key is to use whatever amount of dye necessary to dominate or counter-stain the jaundice.

Once both carotid arteries are raised on this normal, or what seems to be a normal, jaundice case, we can begin to inject downward on the right carotid. The left carotid would be snipped and clamped below the opening to prevent the main flow to the head. The plan here is to test if the dye will dominate the jaundice by looking at the color of the palms of the hands. This solution of three and three bottles of co-injections with dye is generally enough to test if our color will be adequate, and also to counter-stain the head.

If our solution shows the hands turning pink or at least dominating the green with a red–brown tone, we're headed in the right direction. If the solution isn't doing the job, we need to add more dye at this point until it does dominate the green.

Once the palms of the hands tell us we've got the right mix, we inject both sides of the head upward until the green or jaundice color is gone. This is best done by using 20lbs. of pressure and injecting with pulsation at three to five ounces per minute. I like to inject the left side of the head first since you can still make some adjustments to color. Inject both sides of the head with this dominating coinjection with color. Once you've established a better color and the green is gone, inject with your normal strength of solution to handle the tissue and add some dye. When both sides of the head are embalmed, you can tie off the carotids and inject the remainder of the body downward or raise whatever vessels are necessary. I have found that this type of one/two punch delivery locks in the color and the jaundice color doesn't return.

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Have you ever embalmed a jaundice case and it looked to be a good pink tone when you finished, but when you returned the next day the jaundice coloration had returned? Injecting downward on the carotid seems to work but it also permits some shell embalming. The nature and imbalance of jaundice dictates a slow, even saturation of fluid delivered with a pulsator and restricted drainage for even distribution into the calcified cell membranes for even coloration. I've embalmed many jaundice cases using this method and the jaundice doesn't return as long as your solution color is dominant and you deliver it with authority.

Jaundice with Edema: This case is no different than any edematous case, except the color. It will be difficult to preserve because of the fluid content and nitrogenous waste build-up in the body that neutralizes preservatives used for embalming. This type of case could be dangerous if embalmed with the old-fashioned weak jaundice fluid that can work well for normal jaundice. Some of these cases are leaking from the pores and the skin easily separates when handling or repositioning for embalming. Like all extreme edema cases, this jaundice edematous case doesn't need any water in solution. The secondary dilution in severe edema calls for a strong waterless-type solution regardless of the color of the tissue.

The following are some guidelines to help with these types of cases.

JAUNDICE WITHOUT EDEMA

- *Restricted cervical - inject down.*
- *Use a preinjection solution made up of coinjections and dye: three Metaflow, three Rectifiant, and whatever amount of dye needed to dominate the jaundice.*
- *Establish dominant color to palms of hands.*
- *Inject both sides of head with dominant dye and preinjection.*
- *Once jaundice is gone – embalm face with preservative solution.*
- *Tie off carotids, and embalm remainder of body (downward).*

JAUNDICE WITH EDEMA

- *No preinjection, it would just waterlog the already edematous tissue.*
- *Restricted cervical – enough dye to dominate jaundice.*
- *Strong solution - possibly waterless, coinjections, and dye.*
- *Inject down first until jaundice dominated in palms of hands, once palm color shows you that you've dominated jaundice, inject head.*
- *Inject both sides of head until embalmed and color has dominated jaundice. Tie off vessels to lock in new color.*

JAUNDICE WITH EXTREME EDEMA

- *Waterless solution with equal amounts of Metasyn 35, Metaflow, and Rectifiant. Add enough dye to dominate the jaundice.*

These are basic guidelines that could be used. Every case is unique and adjustments need to be made for the strength of fluid to adequately preserve the tissue and the amount of dye used to dominate the jaundice.

The answer to treating jaundice is not found in a bottle of chemical. It is found in the judgment of the embalmer.

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