

SCENES FROM THE OKLAHOMA CITY BOMBING

Wednesday, May 17, 1995, Oklahoma City, OK:



E. William Allen, MD

FOUR WEEKS AFTER THE April 19th terrorist bombing in downtown Oklahoma City, I decided to take my first trip to see the extent of the damage in person. The television images dehumanize the site but it is awesome to behold.

Although the perimeter is cordoned off, I was able to approach on foot to the front of the severely damaged YMCA building which is about 50 feet from the front northeast corner of the Alfred P. Murrah federal office building. This is the most heavily damaged corner with a raw gaping wound extending from the street to the roof, nine stories above, and across most of the block-long width of the building. I strongly believe that it was a miracle for anyone in the building at the time of the bombing to have survived.

The buildings within the nearby vicinity of the federal office building are heavily damaged. Two neighboring buildings have caved-in roofs, and many others have major structural damage. Reportedly, the YMCA building has been shifted off of its foundation. For a several block stretch, it is hard to find a building that does not show some evidence of the bombing such as shattered windows. The smashed automobiles and rubble strewn around the building have been cleared away, and the rescue cranes and workers are now off-duty. The hulls of the buildings, however, remain to provide mute testimony to the treacherous act.

The people who have gathered around the site—and there are many even now—speak in hushed tones, if at all. Life in the United States has not prepared us to deal with an event such as this, and no one truly knows how to respond. Most touching are the many impromptu “shrines” and mementos to those who were injured or perished. They have appeared at points around the perimeter of the site where one can see the destroyed facade of the building. Small teddy bears for the children have been tenderly placed on the ground or in the fencing; fresh flowers have been laid next to those wilted after a few days in the hot Oklahoma sun, which no one wants to remove; hundreds of notes and cards pile up along with a myriad of other expressions of care and concern—most handmade and anonymous.

Four weeks ago to the day, I was beginning another typical day at the University of Oklahoma Hospital, as chief of the nuclear medicine department, when my wife called around 9:15 a.m. She had been outside and heard the explosion from our home, five miles away from the federal office building. She was calling to tell me she was all right since on Wednesdays she usually goes downtown to volunteer at the Literary Council and parks her car directly across the street from the federal building. It is horrifying for me to think that, had she followed her routine that morn-

ing, she would have been walking past the bombing site a minute or two after 9:00 a.m. and might now be dead!

I had neither heard nor felt the blast even though the University Hospital is just about a mile away; the nuclear medicine department is located on the far side of the building, and my office has no windows. As I was talking with my wife, I heard “Condition Black,” the hospital’s disaster response code, announced over the speaker system. We canceled the nonurgent studies for the day, and I and most of our technologists reported to the emergency room. All procedures and the triage system went so smoothly, however, that we were not really needed. As soon as patients arrived, many brought by volunteers in their cars, they were sent to the place for the most appropriate care. The hospital dining area was closed and served as a holding area for those who did not need immediate further attention.

Although more than 50 patients were treated, the work was accomplished in an orderly and efficient manner. Our hospital was not as stressed it could have been. Two other hospitals were closer to the bomb site and received a larger number of patients. Also, the nature of the disaster meant that many victims were initially trapped and time was needed to free them. Therefore, they tended to arrive in a steady stream rather than all at once. By the end of the day, we were more or less back to normal operations.

In the ensuing days, many of our radiology residents were absent because they had volunteered at the county medical examiners office. Under the watchful eyes of the FBI and state police, all bodies and body parts were x-rayed to search for evidence fragments and to match the parts with the correct bodies. For me, the personal involvement did not end until Sunday morning. I was called to the hospital for a cerebral death study on a nurse who had gone to the bombing site to help and had sustained a fatal head injury while there.

In truth, the ordeal still has not ended. Perhaps things will seem more final next Tuesday when the building will probably be imploded or maybe when the state flags will be raised from half mast on July 4 or when a memorial is built at the site. I have a feeling, however, that the horror will fade without ever completely vanishing.

I do not know of a person who did not have a friend or family member injured or dead from the explosion. A good friend of ours was in the building across the street from the bombing site and was hospitalized with multiple, severe lacerations from the flying glass. My chief technologist spent many hours that day and the next three days with friends who could not locate their child until the body was finally identified on Saturday. The official death toll is now 168, including 3 victims still unrecovered. Those who were injured number in the hundreds. The tears are still close to the surface for all of us.

At the same time, I feel tremendous pride for the workers and people of Oklahoma City who responded with such swift action and for the many communities across the nation who sent aid and

helpers. Residents donated so much blood that blood banks announced that they had more donations than they could use or even process. Also, relief organizations such as the Red Cross and Feed the Children responded overwhelmingly. One business owner found and donated "boots" for the rescue dogs whose paws were cut and bleeding from the glass and sharp edges in the building as they searched for living survivors. On the Sunday after the bombing, a local TV station announced that certain supplies were needed and set up a collection point on their grounds. Within 30 minutes, there was a line of cars nearly one mile long bringing needed items.

For the first time in history, I suspect, there was continuous 24-hour TV and radio coverage of an event without a single commercial or advertisement for more than six days in our city. There was not a single case of someone looting the business establishments with bombed-out doors and windows, although the police were busy at the bomb site itself. In fact, there were virtually no reported crimes in Oklahoma City until the weekend after the bombing.

At the public memorial service, more than 10,000 people stood

uncomplainingly in line for hours to gain admittance, and they applauded the loudest for the exhausted rescue workers who took a few hours off to attend. The presence of President and Mrs. Clinton and Reverend Graham was an appreciated response to the events. The healing in the heartland had begun.

Tuesday, May 23, 1995: The remainder of the Alfred P. Murrah federal office building was brought down in 6.5 seconds. Some residents wanted it left as a reminder, but most felt it should be removed. I believe the correct decision was made. I sense a further relief and a progression of the healing process in myself and others. The last three bodies will be recovered in a few days, and the site will be cleared in about two weeks. I hope that a memorial will be constructed soon at the bombing site, where years from now one can visit for a quiet moment of remembrance and reflection on the meaning of this event for our country and ourselves. I hope mostly, however, that this site will be the only such memorial ever needed.

E. William Allen, MD

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Brain Mapping (Continued from page 12N)

experienced no increases in activity. "There was increased activity in the temporal lobes of the high-SAT men, but we don't know why this isn't true for women," Haier said. "Women must be using a different part of the brain not yet identified."

Real Science or Not?

The contradictions that seem to be arising in these studies have alarmed some neuroscientists. If an educated brain works more efficiently, why do men with mathematical abilities have more of an increase in their glucose metabolic rate when performing a complex equation? If sad women have more activated anterior limbic systems, why do clinically depressed people have unresponsive, almost lethargic, limbic systems? "The activity could be on a bell curve," explains Haier, "where the brain activity of people at both extremes is similar." He does, however, concede that this is only speculation and that the brain efficiency versus brain capacity contradictions are, as yet, unexplainable.

Even without these discrepancies, researchers have begun questioning the scientific processes that are being used in these studies. Although PET has the capacity to make quantitative measurements, researchers often do not obtain these measurements in their studies because repeat blood sampling would be required throughout the imaging. They also rely on one human brain from a 60-year-old woman as the standard for determining where brain regions lie. "Human brain shapes are different and the methods of analyses often used in these studies homogenize the normal variations in structures to exaggerate the differences in regions that are activated," said Floyd E. Bloom, MD, editor-in-chief of the journal *Science*.

A third problem with functional brain imaging studies: Researchers use a subtraction paradigm to determine the brain areas being more activated as a result of performing a task. To hone in on the areas stimulated by a complicated task, researchers

The New Brain Imaging Technique

Until now, most human brain mapping research has used PET scans to detect changes in blood flow that accompany increased activity in specific brain regions. Over the past several months, however, many of the mapping studies earning prominent spots in scientific journals have used functional magnetic resonance imaging (fMRI). Case in point: Researchers from Yale University grabbed front page headlines when they used fMRI to find that men and women use different parts of their brains to figure out rhymes.

This new brain imaging method, developed in the early 1990s, has some advantages over PET: "Functional MRI has a very fast time resolution, requiring only 40 seconds for each image whereas with ¹⁵O for blood flow studies, it requires 3 to 4 minutes; with FDG for glucose metabolism studies, it takes about 30 minutes for each image," said Ruben C. Gur, PhD, head of the University of Pennsylvania School of Medicine's Brain Behavior Laboratory. The MRI technique also does not expose patients to radiation, so researchers can perform experiments more readily on children. Moreover, hospitals are more likely to have an MRI scanner than a PET scanner, which requires a cyclotron and is generally more expensive.

There is no indication that fMRIs will eventually replace PET. "A major drawback to fMRI is that it is not yet quantitative," said Georg Deutsch, PhD, associate professor of radiology and neurology at the University of Alabama. Results are based on qualitative comparisons, that is, whether one testing condition produced more or less activity than another condition. "This can't tell you the extent of the increase or decrease," said Deutsch. Although fMRI may eventually become quantitative, it will still be limited in that it can only measure blood flow. PET, on the other hand, can image glucose metabolism and be even more specific by mapping the functioning of neurotransmitter-defined pathways.