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MIS — How Safe for Orthopaedic Surgeons

Minimally Invasive Surgery (MIS) has gained exponential popularity among Patients and Surgeons in recent years. Certainly, MIS is beneficial for patients in particular cases. But a burning question has been raised regarding its safety among Orthopedic surgeons. Studies show that Interlocking nailing and spine surgery has a high rate of radiation among surgeons which is much higher than the normal limit¹⁻³.

As a result of global concern, the International Commission on Radiological Protection and the National Council on Radiation Protection & Measurements defined guidelines to put individuals exposed to greater than 10% of the annual OEL to undergo regular monitoring. The annual OEL (Occupational Exposure Limit) for the whole body is 5000 μ rem¹.

The 0.5 mm lead aprons are not as protective as it blocks only over one-third of the radiation scattered towards the surgeon⁴.

The radiation effect may damage the chromosomes in somatic cells, which typically manifest as cancer; in germ cells, as genetic defects in offspring⁵.

Spine surgeons are more at an increased risk of radiation exposure compared with other musculoskeletal surgeons. This radiation exposure may be 10-12 times greater radiation dose than non-spinal orthopaedic procedures in comparison to fluoroscopically assisted pedicle screw insertion².

Another study shows that there is much higher radiation risk in MIS lumbar microdiscectomy than the traditional open technique. The increase in radiation exposure to the surgeon's eyes/thyroid, chest, and hand in MIS are statistically significant compared to open cases. These values are alarming and are each approximately 10 to 20 times greater in the MIS group⁶.

Chronic radiation exposure may exhibit the first effect in the eyes in the form of cataracts⁷.

It has been documented that Orthopaedic surgeons have an increased incidence risk of cancer compared to non-exposed fields of surgeons⁸.

The thyroid gland is exposed to radiation, and it is thought that eighty-five per cent of papillary carcinomas of the thyroid is due to radiation⁹.

What is of more concern that though Orthopedic and especially Trauma surgeons' use image intensifiers during operations extensively, particularly in minimally invasive procedures, they often neglect the radiation¹⁰.

A recent survey among orthopaedic Surgeons showed that a significant number of surgeons reported no concerns over radiation exposure. And most surgeons did not even have adequate technical knowledge regarding the use of fluoroscopy devices¹¹.

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