Special Article

The Pathologist and Perinatal Medicine Part II Contributing Directly to Patient Care

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In perinatal medicine the pathologist can make an important direct contribution towards enhancing the overall quality of patient care, not only because of the often urgent need for accurate information for reproductive counselling but also because of the particular nature of grief reactions to fetal and neonatal death. He or she has the opportunity to be part of a clinical team and abolish forever the image, which has persisted until recently in large hospitals and pathology institutes, of a remote and often uncommunicative figure, hunched over a microscope or autopsy table, in search of rare cases to add to his collection. The notion of the pathologist as physician is not a new one and several areas of clinical medicine, such as gastroenterology, hepatology, dermatology, nephrology and medical genetics have now, for more than a decade and to great mutual benefit, incorporated specialist pathologists into their clinical and academic environment ; and the concept of multidisciplinary patient management teams is now widely accepted. The pathologist, through the clinical consultative process of a perinatal autopsy or fetal pathological examination, and by facilitating other aspects of perinatal death management, can make several very positive contributions to direct patient care in perinatal medicine.[1] These contributions include the provision of accurate, timely and sensitively expressed verbal and written information both to clinicians caring for the mother and baby, and where requested and appropriate, directly to the parents and family. Of equal importance is the provision of accurate facts and expert opinion to aid in genetic diagnosis and counselling. Furthermore, it has long been recognised that information derived from an intelligently performed autopsy plays an impotant role in the process of clinical audit at unit and at hospital level, providing confirmation of prenatal and postnatal ultrasound findings on the fetus, placenta and neonate, defining iatrogenic

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complications and evaluating the effectiveness of therapeutic interventions.[2,3,4] Very few special resources other than an interested well informed and motivated pathologist, with good communication skills, supported by a sensitive, equally motivated and clinically aware pathology technician, are needed.[1] It is essentially the quality, timeliness and relevance of the information that defines this contribution to direct perinatal care. As well as providing information of direct clinical relevance, the pathologist can make a substantial contribution to the psychosocial management of fetal and perinatal loss, and this aspect of the pathologist's role will be reviewed in some detail later in this paper.

General Information for Parents

The pathologists first responsibility to parents who have consented to an autopsy on their dead baby or fetus is to provide, generally through the obstetrician or neonatologist directly involved, a clear, accurate, and meaningful preliminary autopsy report, preferably within 72 hours of the autopsy and with sufficient information to allow early discussion with parents. Such a report should include macroscopic findings, with a comment on their likely significance, an indication of further work in progress such as bacteriology, virology or cytogenetics, with, where appropriate, recommendations about further diagnostic tests on maternal blood, and should preferably also include a clear provisional summary linking the clinical and pathological findings as far as possible. It is also helpful if the pathologist can indicate to what extent, in the individual case, histopathological examination is likely to further contribute. For example, while it is clearly essential to await a final histology report before counselling for cystic renal disease, with an isolated neural tube defect, histopathological examination is unlikely to alter the final diagnosis and genetic counselling can therefore often be arranged at an earlier date. If an unusually long delay is expected before either the provisional or the final report is issued in hard copy, then direct discussion with the clinician with an interpretation of the findings, as far as possible, is a professional courtesy usually greatly appreciated. Too often, clinician and thus patients are left waiting for 6-8 weeks with either no report at all or only with uninterpreted and therefore virtually meaningless pathological descriptions.

Bereaved parents have many, often unspoken, questions in their minds such as: *why us? or how did it happen? or did the baby feel pain or suffer? or whose fault was it? or was there anything we did or did not do that caused it?* as well as the more obvious and more easily answered questions about recurrence risks, prevention and earlier detection in subsequent pregnancies. Pathologists can contribute to helping resolve parental guilt, by remembering at the

start of each autopsy that some or all of these questions may need to be addressed.

There is some evidence that, as well as its medical usefulness, a perinatal autopsy can be psychologically helpful for parents by reducing their feelings of guilt. Parents often consent to an autopsy, even when there is already a known clinical explanation for the death.[5] Even if nothing unusual is found, the simple demonstration that the baby is normal can be reassuring. It may therefore be useful to emphasize these benefits to the family, rather than to discuss any unresolved clinical issues, when seeking consent for autopsy. When discussing autopsy, parents should always be informed of what the process means, that organs may be retained for further examination and that they have a right to refuse or limit the procedure.

Often early and sensitive communication, particularly in cases of unexpected intrapartum death, where there may be expressed or suppressed anger or hostility toward the obstetrician, will defuse the situation and avert the threat of litigation.

Perhaps the most difficult task both for pathologist and clinician is to try and explain to parents the sudden intrauterine death, a few weeks before the expected date of delivery, of an apparently normally developing baby of a mother who has had regular antenatal care, who has no obvious risk factors and is anticipating the birth of a healthy infant. There is as yet very little evidence concerning risk factors for sudden, unexplained, late fetal death, and once specific identifiable causes such as massive fetomaternal haemorrhage and overwhelming fetal infection have been excluded, it is perhaps best to simply indicate that, as yet, there is very little known about the reasons why some apparently normal babies die suddenly before the onset of labour and that all that is known about the mechanism is that there is evidence of sudden severe fetal anoxia.

General Information to Clinicians

If the pathologist is to fulfil a role in improving the quality of direct patient care, he or she should be prepared to address a range of clinical questions at the time of autopsy and be prepared to produce evidence in support of his conclusions. These include 1) assessment of agreement between clinically assessed gestational age, pathologically assessed gestational age and fetal growth, 2) timing of death and likely mechanisms and sequence of events leading to death, 3) specific abnormalities in fetus, neonate or placenta contributing to death, 4) factors in antenatal intrapartum and where appropriate neonatal periods contributing to final process of death, 5) existence and significance of other abnormal findings, 6) comparisons with clinical diagnoses and reasons for any discrepancies, 7) any unexplained and unaccountable patho-

logical findings and 8) significance of any of the findings for the family's future reproductive potential and on any living siblings and ensure a mechanism for discussing these issues further. If the pathologist is in the habit of routinely addressing all these questions and ensuring that appropriate tissue is sampled at autopsy to answer the first two questions and that the final summary contains answers to all the questions, then one important clinical function will be fulfilled. The simple process, often overlooked, of assessing organ maturity by pathological markers such as brain convolutions, renal cortical development and structural maturation of the lungs, and correlating these with growth parameters, ultrasound evidence of gestational age and menstrual dates, is a useful habit. Likewise, microscopic examination of the growth plate of a rib, together with qualitative assessment of the amount and pattern of fat in the fetal cortex of the adrenal using a simple fat stain on frozen tissue, and assessment of involutionary, or socalled "stress-induced" changes in the cortex of the fetal or ear lyneonatal thymus, can provide a striking picture which may help distinguish between a fetus who dies suddenly without evidence of obvious pre-existing compromise and a fetus or newborn who has been severely stressed for some time, such as occurs when there is fetal hydrops from any cause, in some chronic fetal infections and to a lesser degree when there is a prolonged growth retarding stress.

Information for Clinical Audit of Individual Cases

Part of the function of a perinatal autopsy is to help provide reassurance to individual clinicians that their diagnoses were accurate and that their interventions were appropriate and free of complications. This depends on a careful and unbiased assessment of the full clinical history with the pathologist being aware of all interventions of clinical diagnoses and of the results of any special investigations. It is therefore up to the clinician to ensure that medical records and other information are readily available to the pathologist and, if not then, to communicate full details in some other way. Clinicians may wish to be present at the autopsy or may wish to be involved with special dissections of organs of interest to them, for example, a paediatric cardiologist or surgeon may wish to see and handle a heart with complex malformations.[7] This is to be encouraged since both may greatly benefit from the discussion, even if it is necessary for the pathologist to reorganise his or her time.

As well as providing accurate and clinically relevant reports in sufficient detail to allow full discussion with the family of the dead baby, the pathologist can contribute actively to clinical audit processes, both internal audit and where it exists, regional perinatal mortality audit, through active participation in perinatal morbidity mortality review

committees or meetings, and in any regional perinatal committee set up to monitor perinatal outcomes. The pathologist's contribution to hospital perinatal mortality meetings needs, however, to be more than the demonstration of a catalogue of unusual pathological findings, which, though undoubtedly fascinating to pathology colleagues, may have little bearing on the clinical problems under scrutiny. Rather than using valuable discussion time to describe pathological findings in tedious detail, the pathologist can more effectively contribute, as a well informed member of the specialist team, by producing evidence to answer key clinical questions about the mechanisms, time course and severity of disease, and by highlighting unexpected complications, and any discrepancies between clinical, ultrasound and pathological findings. It is in the peer review environment of a mortality meeting that errors of clinical judgement may be frankly discussed, and this may result in recommendations to change specific clinical practice. Again, this type of contribution depends, not only on the quality of the autopsy, but is greatly enhanced if the pathologist has a broad overview of current issues and controversies in high risk obstetrics and perinatology. In an ideal situation, the pathologist will arrange to have easy access to current perinatal literature, including overviews of clinical trials, and will keep up an active and informal dialogue with clinical colleagues in order to maintain and update knowledge of the evidence on which modern obstetric practice is now based. In this way, his or her clinical knowledge base is continually updated, and he or she is less likely to make inappropriate diagnoses, comments or recommendations on pathology reports that may later embarrass the clinician, that risk misinterpretation by clinician or patient or, worst of all, encourage litigation. The pathologist must, however, be sufficiently modest and sufficiently realistic to acknowledge the limitations of the perinatal autopsy, and recognise the lack of hard evidence to support many clinical concepts.

Guidelines for perinatal-death review committees and for their annual reports have been developed and can be modified to meet local needs.[8] When there are set standards for perinatal mortality-morbidity review committees and when appropriate items are included in their annual reports, then there is a chance that their recommendations will be taken seriously by colleagues, hospital administrators and those responsible for perinatal care policy.

Specific Information to Enable Identification of Genetic Diseases

Good-quality reproductive counselling after the death of a fetus or neonate, with known or previously unsuspected abnormalities, or after termination of pregnancy for pre-

natally diagnosed abnormality, depends on the accuracy of diagnosis.[9] The accuracy of diagnosis is often greatly enhanced, particularly where there are multiple congenital abnormalities, not only by the quality of pathological examination of the baby and the placenta, but also by the breadth of the pathologist's background knowledge in medical genetics and clinical dysmorphology, and by the level of co-operation between pathologist and medical geneticist/ clinical dysmorphologist. Apart from the cost of karyotyping, which should only be done with clear indication, no special or expensive material resources are needed, as the quality of information is largely determined by knowledge, expertise and good communication. The pathologist and the medical geneticist can usually, with the help for difficult cases of one of the computerised databanks,[10] make a genetic diagnosis adequate to allow recurrence risk counselling, help future management planning and where available, propose prevention strategies. Information derived from pathological examination may be helpful in virtually all the areas usually covered during a genetic counselling session, i.e., diagnosis, natural history, recurrence risk,. therapies and future planning. It is clearly important that an autosomal recessive dysmorphic syndrome, such as Meckel-Gruber syndrome, Fraser syndrome or Smith-Lemli-Opitz Type II syndrome, be distinguished from those sporadic and chromosomal syndromes, which they may externally resemble, and that those sporadic conditions, currently considered as either developmental field defects or vascular disruptions, for example, amniotic band syndrome, schisis association, VACTERL sequence or caudal regression sequence, be distinguished from both of the above.

Specific Information to Enable Identifcation of Nongenetic Diseases

By recognising the variable manifestations in the fetus and placenta of nongenetic maternal diseases, for example, systemic lupus erythematosis, antiphospholipid antibody syndrome or unsuspected maternal diabetes, the pathologist can make a valuable contribution to diagnosis and future management planning. Moreover, if the pathologist is aware of the variable presentations of chronic intrauterine infections affecting the fetus, such as toxoplasmosis, cytomegalovirus, parvovirus, varicella-zoster or syphilis, he or she can recommend additional tests on maternal or fetal blood. If these diagnoses are able to be formally confirmed after autopsy when, as is often the case, there is no single, pathognomonic feature, the overall diagnosis may be as accurate as possible, and the risk of recurrence in a subsequent pregnancy may be assessed.

Psychosocial Management of Perinatal and Fetal Loss

There is now considerable interest worldwide in the psychopathological and psychotherapeutic aspects of fetal and neonatal bereavement and in variations in the length and intensity of grief reactions in specific situations.[5,11-18] While there is an overall pattern of normal and pathological behaviour after perinatal loss, some differences have been identified. Reactions to deaths of very low-birthweight babies, after neonatal intensive care,[19] may differ from those following unexplained late fetal death, and these may again differ from reactions to spontaneous second trimester fetal loss, first and second trimester social terminations or genetic terminations[14] and after death of one of a pair of twins or of higher orders of multiple pregnancy, including fetal reduction procedures.[20] Responses to second trimester loss have recently been identified as being unexpectedly intense.[17,18] Cultural, educational, religious and socioeconomic factors,[5] as well as partner support and parental immaturity,[16] have all been proposed as influencing grief reactions. Other than a small amount of information on the established Asian immigrant groups in Britain,[21] there is very little published work on attitudes to fetal and perinatal death outside a European and North American context, and further work on this subject may be of value in the Asia-Oceania region. Despite the interest in the subject of perinatal bereavement in general, there have been very few systematic evaluations of the value of support and counselling[15] and only one randomised controlled trial.[22] In hospitals where this type of support is not yet routinely offered, there may be a place for further trials of the effectiveness of various methods of supportive management.

There is a very significant role for the pathologist and pathology technician in the psychosocial management of fetal and neonatal loss, much of which revolves around the process of helping the patient confirm the reality of fetal or neonatal death,[11] and includes having helpful information available early, encouraging naming the baby, making the funeral arrangements, arranging the location of a marked grave and the collection of mementoes and other artefacts.[5] Most aspects of this process can be encouraged, actively supported or facilitated by the pathology service. There is some evidence[5,23] that grieving is facilitated if the mothers and other family members are permitted to hold the baby, however small and malformed, for as long as they wish, within reasonable practical limits, after death. It has been suggested that maternal perceptions of fetal abnormality are exaggerated if the mother is not allowed to see and hold her congenitally malformed fetus, and that many expect it to look much worse than it does.[13] Either research needs ok pathology department convenience must not be allowed to override parents rights to handle their

baby.

In exceptional cases such as when the confirmation of a suspected rare and inherited metabolic disorder requires autopsy within two hours of death, in order to collect fresh tissues for biochemical analysis, this should be fully discussed with the family and with the pathologist before delivery, or before withdrawal of life support. The pathologist must then be prepared to carry out an urgent autopsy, if necessary, in the middle of the night. Fortunately, such events are rare but require careful co-ordination so that valuable genetic information, essential for counselling the family, is not lost.

As it is not uncommon for family members to wish to view the body again after autopsy, it is desirable that the pathologist and technicians develop methods of cosmetically satisfactory reconstruction of the baby. Small fetuses are difficult to reconstruct, as the skin is usually too thin to hold even fine sutures, and alternative techniques have been used, including the use of a colourless cyanoacrylate adhesive ("super-glue").[24] Normally the face, hands, feet and genitalia are never incised but are left untouched, and it is rare that limbs need to be examined. If, however, as is essential, a fetus or neonate is suspected of having skeletal dysplasias, long bones have to be removed for histopathological examination to aid classification and genetic counselling. Then reconstruction of limbs with wooden rods or rolls of stiff thin cardboard to restore rigidity is essential. Skin defects in the small fetus that cannot easily be repaired can be closed with a patch of amnion and cyanoacrylate glue.[24]

Requests to dress the baby after autopsy, often in clothes bought specifically for the purpose, should be respected by the pathologist, as should any requests to include accompanying toys, flowers, photographs or other objects for burial with the body. A pathologist who, from carelessness, haste or insensitivity overlooks these ritual aspects of perinatal death can cause considerable additional distress. Similarly, it is occasionally necessary for the pathologist and technical staff to allow simple religious ceremonies to take place in the mortuary for an infant of fetus who is not having formal funeral rites.

Photographs of the dead baby may be an important aid to coping with the realities of perinatal death.[11] The polaroid type of photos, often taken in the delivery room, while adequate in the short term, fade and discolour, and thus permanent colour print photographs or slides of the baby or fetus, both wrapped and unwrapped, are preferable. It has been suggested[13] that photos of the unwrapped, naked fetus or newborn are particularly important in helping the mother to cope with the reality of the death. For the same reason, however, the baby should not be made to look too artificial and doll-like. It is of course possible for delivery room staff to perform all these functions, and this may be necessary if there is to be no

autopsy. It is, however, our practice to receive all dead fetuses and neonates into the hospital mortuary so that the pathology technical staff can collect mementoes and take suitable photographs for the parents. In the busy environment of a teaching hospital delivery suite, there may not be time to take quality photographs there, whereas in the pathology department, there are less competing pressures. It hardly needs to be emphasised[13] that the usual type of photographs taken for pathology records are usually not suitable for parents as mementoes.

The provision of a small package of mementoes of the dead baby or fetus is now becoming a standard part of perinatal autopsy practice, and should be carried out even if there is no autopsy. Nursing staff in neonatal intensive care units have done this for some years, but it is only more recently that the practice has extended to genetically terminated second-trimester fetuses and to stillborn babies. Rates of acceptance of such mementoes are high.[25] Such mementoes may include footprints and handprints made with an inkpad onto a small card bearing the baby's name, hospital identification bracelets and locks of hair. These, together with colour or black-and-white print photographs, are collected as a small package, as a routine on every baby and fetus, and offered to the mother at the time of postnatal follow-up visit or subsequent counselling.

Naming the baby or fetus is usually encouraged and once this is done it is appropriate that the pathologist include the given name of the baby or fetus on any reports and correspondence. Mistakes by nursing or medical staff in identifying the sex of the fetus, most common in second trimester deaths, can be a cause of considerable parental distress. Nursing and medical staff in the delivery suite who are uncertain of the gender of smaller fetuses are advised to leave this aspect of the clinical examination to the pathologist, who can confirm external impressions by internal examination. The hypertrophic clitoris of the second trimester female fetus is the usual reason for confusion; a fetus may be incorrectly designated as a boy, with the parents later being told that the documented gender has been changed, and they may then feel obliged to change the baby's name. For larger neonates with ambiguous genitalia, the pathologist is strongly advised to consult the paediatrician to find out the parents perception of gender in order to avoid tactless and potentially distressing errors in the written report.

An additional area in which the pathologist can play a useful role in patient care and which has been standard practice in our hospital for at least six years, is the production, for the parents request, of a summary of the autopsy report in nonmedical language. Although the value of these reports has not yet been critically evaluated, they appear to be helpful and are widely requested. They are not sent directly to the mother but

sent through a medical officer .nominated by her, which may be her general practitioner, her obstetrician or her paediatrician, so that the content and style can be scrutinised for appropriateness, as well as for her level of education and general understanding, modified if needed, or passed on directly with further explanation and discussion. In the six years since we instituted this practice, we have not yet had any clinician request a modification to any plain language report. It is not our usual practice to offer the full technical report to parents, and though this is never withheld if requested, we always strongly recommend that it be fully explained by the pathologist or clinician at the time of handing it over.

The most obvious and direct role that the pathologist, as a professional, can play is when he or she becomes directly involved in the postautopsy counselling, as has been the practice in some centres for many years.[26] In reality, this is rarely practical for busy pathologists with a large and urgent surgical pathology workload, and impossible in regions where there is a serious shortage of pathologists.

The pathologist may, however, choose to have professional input in an advisory capacity into groups such as SANDS (Stillbirth and Neonatal Death Society) which provide support for self-help networks of bereaved parents, or by various other means, make himself or herself available to parents and to the community for general advice. Some general caution in this area is however advised. A recent annotation which summarises contemporary attitudes to the management of perinatal death highlights the emerging problem, in Europe, North America and Australia, of magnifying every first-trimester miscarriage into .a major reproductive catastrophe.[27]

Unless there are strong religious objections, then autopsy consent for a fetus (if required by law) or for a neonate is usually easy to obtain, so long as an adequate explanation of the benefits and of the process itself are given. While it is the responsibility of the medical staff to seek consent, this may be easier to discuss when the clinician knows that the autopsy is to be carried out by an experienced perinatal pathologist and, therefore, more likely to yield meaningful results. It may also be worth emphasising that an autopsy is not a complex laboratory test but essentially a clinical examination and consultation. All clinical staff concerned should be aware, however, that there are limitations to the amount of information obtainable from autopsy, particularly with macerated babies and should try not to raise unrealistic hopes and expectations in the parents.

Midwives and perinatal nurses can contribute a great deal, if they are themselves well informed about the process of autopsy and its value and can do much to help the patient come to a decision. This is an area which

can be usefully included in post-graduate perinatal nursing courses. Pathologists can do much to educate nursing and other clinical staff not only about the reasons for and benefits of autopsy examination, but also about the existence of available options and the additional services available to support management of the grieving process and, thereby, help dispel fears and, outdated, or negative attitudes.

In those countries where a fetus or newborn under 28 weeks gestation does not require a death certificate or need to be legally disposed of, it is often of help to the parents to know that an acceptable form of disposal will, nevertheless, occur. This can include cremation in the hospital with scattering of ashes in a specified place, such as a small memorial garden specified and dedicated to the purpose, or burial in a specified but unmarked grave. In Australia, where birth registration death certification and burial or cremation is mandatory for all fetuses and neonates over 20 weeks gestation or 400 grams birth weight, there is an increasing trend for parents to request simple funerals with burial or cremation of these unregistered smal-ler fetuses. This is particularly so, after genetic terminations of pregnancy, where the decision may have been a difficult one and the pregnancy much wanted. It is probably not advisable for parents to be told that a fetus has been cremated or buried, if in reality it has merely been discarded along with usual pathological waste. Clearly, however, theimportance attached to these issues depends on community, religious and cultural practices and on the attitude of the parents towards the particular pregnancy.

In addition to recognising cultural differences in attitudes to perinatal death, the pathologist needs to be aware of the various cultural attitudes relating to the placenta and its handling and disposal, ranging from general disgust to a rich mythology surrounding its overall significance.[28] After necessary tissue samples have been taken, cultural attitudes should be respected and accommodated, as far as is reasonably practical, unless there is an overriding medical reason or a major infectious hazard.

Limited Autopsy

When there is a reluctance by parents to consent to full autopsy, then some form of limited procedure may be acceptable and can often provide reasonable quality information for reproductive counselling. The pathologist should not discourage this approach but regard it as a creative challenge. In some communities where there is strong local prejudice against autopsy, it may be necessary for the pathologist to develop alternative approaches. These may range from needle biopsy of major organs under ultrasound guidance[29] to ingenious techniques requiring considerable pa-

tience and manual dexterity, whereby abdominal and thoracic organs are removed for examination through a limited epigastric incision. Postmortem ultrasound scans are occasionally useful as an alternative or an adjunct to autopsy, as is contrast radiography. Clearly, some of these techniques are costly and others time consuming, and this needs to be balanced against potential benefits to the parents and clinical staff, as well as against the quality of information gained and its contribution to audit and to epidemiology. It is up to the pathologist, nevertheless, to inform clinicians of all available alternative techniques, rather than take an 'all or none' approach to an autopsy. Much valuable information can be gathered simply by careful external examination, and detailed documentation, with clinical photography and a range of anthropometric measurements[30] and plain radiographs.[31]

Regardless of whether or not there is consent for autopsy, efforts should be made to ensure that the placenta is made available to the pathologist and submitted unfixed, so that it can be used for cytogenetics or microbiological investigations, as indicated. Even if autopsy consent is withheld, examination of the placenta by an appropriately experienced pathologist, with a full understanding of the clinical issues, may be able to confirm important diagnoses contributing to perinatal death, or to fetal malformations. Obvious examples include diagnosing amniotic fluid infection as a cause of preterm birth or neonatal infection, identifying significant vascular pathology seen in lupus and hypertensive disorders in spiral arteries on the maternal surface of the placenta, identifying amniotic bands and identifying severe villitis of chronic fetal infection or the characteristic inclusions of human parvovirus infection. Conversely, examination of the placenta by a pathologist can provide useful negative information, which may not be obvious on general inspection by obstetrician or a midwife, who may an label as "unhealthy looking" or "infarcted", a term placenta which on pathological examination proves to show only calcification and/or intervillous fibrin, both essentially of no significance. There is an increasing trend to try and attribute perinatal death or adverse perinatal outcome to placental lesions,[32] not always on good evidence. This is being driven by the threat of litigation, most commonly when cerebral palsy develops after alleged birth asphyxia and where, to protect the obstetrician, there is a need to search for placental evidence of antepartum fetal injury or disease. It is up to the pathologist to make a careful and dispassionate assessment and to avoid overinterpreting trivial lesions as evidence of prenatal injury. It is important, therefore, that placental examination, particularly if there is no autopsy, or if the baby survives but is neurologically compromised, be carried out by an appropriately experienced pathologist and not merely

sent to a busy general surgical pathology department, fixed in formalin, with no clinical information and with only a polite but cursory request for "histopathology please".

Multidisciplinary Management of Prenatally Diagnosed Fetal Abnormality

In the last few years multidisciplinary teams for the management of prenatally diagnosed fetal abnormalities have become accepted practice in many centres including our own, which started as early as 1987.[33] Such a team, often called a dysmorphology group, fetal board or antenatal diagnosis and counselling service, are probably most effectively run as prospective diagnosis and management groups, enabling the concentrating of clinical material and the expertise of relevant specialists to co-ordinate the management of referred cases.[33,34] Groups such as these tend to meet regularly, often weekly, if the volume of referred material should warrant this, and by means of team discussion, review and discuss the abnormal ultrasound scans, arrange initial counselling, recommend further action such as additional scans or invasive procedures, review results again and recommend options for management, which may include proceeding with the pregnancy, with a planned delivery at or before term, offering fetal therapy where available or offering termination of pregnancy. patient and her partner are seen by an appropriate medical member of the group, and the diagnosis, its implications and the various management options are presented, with non directive counselling. Initial counselling is often undertaken by a perinatologist, particularly for common and well understood conditions, by a medical geneticist for rare inherited disorders and dysmorphic syndromes, by a paediatric cardiologist for congenital heart disease or by a paediatric surgeon for potentially treatable conditions such as bladder outlet obstruction. During the days or weeks between diagnosis and decision making, a nurse counsellor is available to support the parents and facilitate contact with the appropriate group member; once a decision is made, this person can then provide ongoing support for that decision. Cases are seen on referral, and the referring clinician is kept fully informed. It is important that such a group does not degenerate into an exclusive club for collecting exotic cases for publication, and that it remains primarily a patient care service. However, it is desirable that the group's performance be internally evaluated from time to time and that any diagnostic or clinical management algorithms or protocols be regularly and critically reviewed against current evidence-based best practice. Such groups, which seem to be most effective if they remain small, usually include, as core members, those senior medical staff with expertise in fetal ultrasound, maternal-fetal medicine, neonatal paediatrics, paedi-

atric, and where available, fetal surgery, medical genetics and perinatal pathology. While access to expertise in perinatal microbiology and haematology, and in paediatric clinical chemistry, is desirable, most clinical problems present as a result of secondtrimester scans, and most can be managed by the core group. In order to fully contribute to patient management of prenatally diagnosed fetal abnormality, the pathologist must perceive him self or herself to be a fully committed team member and earn this place by demonstrating the same level of awareness of current literature, of enthusiasm and of sensitivity as the clinicians. The regular presence of a pathologist in this type of forum is beneficial in several ways: 1) The pathologist, together with the medical geneticist, often has the best grasp of likely differential diagnoses of multiple abnormalities presenting on scan and can advise on specific areas of the fetus to be assessed in subsequent detailed scans. 2) A perinatal pathologist with some clinical pathology experience is in a position to advise or at least co-ordinate investigations on amniotic fluid or on fetal blood samples collected by cordo-centesis. 3) Should termination of pregnancy be the agreed management decision, then the pathologist is alerted early to the need for complex or specialised autopsy procedures, urgent biochemical tests on fresh tissue or any specialised imaging procedures, as well as any special |social religious or cultural needs of the parents.

If the pregnancy is terminated after prenatal diagnosis, the pathologist has specific responsibilities when examining the fetus, and these have been summarised as threefold.[35] The primary objective is the confirmation of the abnormality for which the pregnancy termination was performed. The second is the careful examination of fetus, placenta cord and membranes for any abnormality or complication related to or arising out of a prenatal diagnostic or therapeutic intervention. The third is the meticulous documentation of all abnormalities present, in order to allow accurate genetic and general diagnosis and counselling. The first two represent part of the pathologist's quality control function in prenatal diagnosis by ultrasound and, the effectiveness of this process has been confirmed.[36,37] The last represents one of the pathologist's direct contributions to clinical care.

It could be said that the commitment by a pathologist to this type of multidisciplinary group management exemplifies all the roles that the pathologist can play in perinatal medicine, that is in direct patient care, in the auditing of prenatal diagnostic procedures, in the monitoring of outcomes of high technology intervention and in the improvement of epidemiological data through more accurate diagnosis of fetal abnormality.[38]

Conclusion

It should be emphasised that if

the pathologist is able to see each patient not as an unusually large and interesting pathology specimen but in the same way, the clinician, as a complete fetomaternal dyad in a broad biological and sociodemographic context, then his or her contribution to patient care is immeasurably enhanced. Thoughtful examination of the deceased neonate or fetus and its placenta by a motivated and well-informed pathologist can contribute much to direct patient care. It is important, however, that this service is accompanied by careful and culturally sensitive handling of the body, and by timely and sensitive communication with clinicians and where requested, parents, both before and after the autopsy.

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